THE IRON TRADE REVIEW

Volume L CLEVELAND, MAY 2, 1912 Number 18

Heavy Specifications Increase Mill Activity

New Prices in Finished Materials Generally Maintained—Coke Conditions Check Increase in Pig Iron Production—Plate Market Strong

Liberal specifying against contracts for finished materials has resulted in increased mill activity and general conditions as to pig iron and finished products are very favorable. Naturally, following the heavy contracting which preceded the advance on bars, plates, shapes and sheets, there has been little buying and it is not expected that there will be in the near future. In the Philadelphia district, prices of finished material still show some irregularity, but in other parts of the country quotations are being well maintained.

The Steel Corporation's unfilled tonnage statement, to be issued next week, will show a large increase. New bookings throughout April have greatly exceeded shipments notwithstanding the very large extent of the latter, as the Corporation mills are now running 94 per cent of ingot capacity and continue to produce steel at a heavier rate than ever before in their history.

Pig Iron

Pig iron buying during the past week has not been so heavy as during the preceding week, but numerous sales of moderate tonnages have been made. There has been considerable buying at Buffalo, including a large part of from 20,000 to 25,000 tons of foundry grades sold for delivery in New England. A leading foundry interest has taken a round tonnage at Detroit. In the Pittsburgh territory, inquiries for 45,000 tons of basic are pending. A sale of from 5,000 to 10,000 tons of basic has been made at $14.40, delivered, at Chicago Heights. The well booked condition of eastern Pennsylvania furnaces, together with the restraint placed upon heavier production by conditions in the coke market, continues to support firmness of price and a more healthy general market tone. Larger consumption in eastern districts is shown by the shrinkage of stocks on furnace banks and in consumers' yards. Several of the steel plants have been reducing their accumulation very decidedly. Shipments of prompt iron from merchant stacks have been more numerous and as the consequence pig iron stocks at merchant plants and steel works, which recently stood at approximately 100,000 tons in eastern Pennsylvania, are now estimated to be considerably below that mark. Similar conditions prevail in Virginia, where the stocks up to the time of the recent movement were about 200,000 tons. Standard grades of eastern Pennsylvania foundry iron are selling usually at about $15.25, delivered in the Philadelphia district, for No. 2X. Central Pennsylvania brands are quoted from $13.50 to $13.75, furnace, but this quotation has been shaded 25 cents. Virginia iron is pegged at $13, furnace, for No. 2X. Quotations on Alabama irons are slowly hardening. The leading cast iron pipe maker has closed with the Tennessee Coal, Iron & Railroad Co. for 30,000 tons of southern grades for second quarter shipment on a basis equivalent to $11.25 for No. 2. A southern steel maker has placed 15,000 tons of basic for second quarter with the same maker at $11, Birmingham.

Railroad Buying

The Norfolk & Western railroad has asked for bids for the construction of a large coal pier at Norfolk, Va., which will require about 4,000 tons of shapes and 3,000 tons of plates. The Boston & Maine is expected to buy from 4,000 to 5,000 tons of structural material. During the past ten days, contracts for from 12,000 to 15,000 cars have been placed and it is estimated that 40,000 cars are pending. The activity in car buying is reflected in increased strength in the plate market. Some plate mills are not able to make deliveries in less than 60 days. Rail business is fairly active and some systems, which had bought round lots, are again coming into the market. One western line has just closed with Steel Corporation mills for a supplemental order for 65,000 tons. The Grand Trunk Pacific has awarded the Corporation 40,000 tons of Bessemer rails, to be rolled at South Chicago. The Canadian Pacific has bought 15,000 tons of 85-pound rails, to be rolled at Gary. The Tennessee company has taken 3,700 for the Central of Georgia and 4,000 tons for the Grandin Lumber Co.

Coke

The coke market is attracting much attention. Operators of a number of furnaces would like to blow in their stacks if satisfactory contracts for coke could be made, but there does not seem to be any prospect that they can contract for less than $2.50, for delivery during the last half of the year. It is conceded that the production of the Connellsville region cannot be greatly increased this summer, and that the present output is just about equal to the demand. Some furnaces may be blown out unless they can contract for last half at less than $2.50. On the whole, the outlook is that production of pig iron during the next few months will be increased little, if any, and that pig iron prices will be firm.

PITTSBURGH

Increasing Plant Activity---Prices Are Strong

Office of THE IRON TRADE REVIEW.
2148-49 Oliver Bldg., April 30.

There has been a gradual absorption of inactive capacity in most lines of finished and semi-finished steel, with a consequent stronger tone to prices, during the past week. Independent producers of billets and sheet bars have taken the lead in advancing prices, being forced to such action by rapidly increasing consumption and limited supply. Pig iron buying has shown signs of increasing activity. Some important inquiries are out for basic and recent sales show no signs of weakening prices. The shortage of furnace coke is continuing in spite of favorable weather and labor conditions and prices are remarkably firm at higher levels. Some improvement is noted in the demand for light rails. Car buying by railroads has filled plate mills with business for some months ahead and is causing talk of a further advance in prices on this product. Pipe buying is active, but there is talk of severe competition in steel line pipe and oil country goods that is holding prices in check for the present. Merchant pipe is strong and prices firm. The entire market is showing an optimistic attitude toward the last half of the year, regardless of political unrest.

Pig Iron.—An inquiry for 20,000 tons of basic iron for delivery during the third quarter has appeared in the market this week, and in addition, negotiations are pending for 25,000 tons of basic iron for May and June delivery by a Pittsburgh consumer, which does not include the expected purchase of some basic and a round lot of Bessemer iron by the leading interest. A sale of 6,000 tons of basic is reported at $13, furnace, this week for prompt shipment. Small lots are selling at $13.25. Bessemer iron is generally quiet and prices are unchanged, the bulk of the business in small tonnages going at $14.25, although one sale at $14.40 was reported during the week. There is a more active demand for malleable, and this iron is being held firmly at $13.25, valley. No. 2 foundry is selling at $13.50 for last half, and gray forge at $13.10 to $13.25. There is more activity in the demand for charcoal iron than for some time, the sales, however, being confined to small lots. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	13.00
Basic, Pittsburgh	14.15
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.10

(Third Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, Pittsburgh	14.15
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	14.00
Malleable, Pittsburgh	14.15

Ferro-Alloys.—Demand for ferro-manganese is very quiet and sales are confined to small lots of car-load sizes, and prompt shipment orders bring $50, Baltimore, and better. A new price of $46, Baltimore, has been fixed by the makers for last half delivery. This price was announced this week and caused some surprise, as it is an advance of $2.50 a ton over the quotation made by the same makers a week ago. The inference is also drawn that this new price will likely be withdrawn and a higher one charged in the near future. Fifty per cent ferro-silicon is quiet and is moving in small lots, the market being firm at $70. Domestic grades are unchanged in price and are slightly more active.

We quote ferro-manganese at $46.00, Baltimore, and $50.00 for prompt delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $70, Pittsburgh, for prompt and forward delivery; 12 per cent, $22; 11 per cent. $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—The plate demand is the heaviest reported in many months, and not only have specifications become greater, but new tonnage brought out through the car material orders placed during the past 10 days has so filled the plate makers' books that prices are no longer questioned at 1.25c, f. o. b. Pittsburgh. It is, however, difficult to secure shipments within 60 to 90 days. During the past ten days there have been placed about 12,000 to 15,000 cars and new business by leading railroads, and there remain to be placed, it is estimated, about 35,000 cars more. The leading interest is in a strong position on orders, and prices are extremely firm. Large independents are holding the same position, the Cambria Steel Co. demanding eight weeks on shipments of sheared plates. This company reports rapidly increasing specifications. A week ago some of the large producers were inclined to be a little weak on maintaining the new prices, but this sentiment has disappeared, and there is already talk of a further advance. Among the car orders reaching the local market were 1,000 cars for the Kanawha & Michigan railroad; 250 cars for the Lehigh railroad; New England Coal & Coke Co., 500 coke cars, which went to the Cambria Steel Co.; Santa Fe system, 1,000 box cars, to the Standard Steel Car Co., and about 1,950 cars to the American Car & Foundry Co., 600 box and flat cars to the Western Steel Car Co., while a large number of small orders varying from 50 to 500 cars represent a large aggregate of new business. The demand for ship plates is also active and inquiries are for large tonnages. Plate makers report the present outlook as favorable for an unusually active year, and at better prices. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.25c. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c Gages under ½ inch to and including 7/16-inch plate on thin edge, 0.10c; under 7/16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The market for sheets has become interesting because of the sharp increase in specifications, and the apparent necessity of buyers to take their contracts at an early date. As a consequence, manufacturers are busy, and

the April record for production and shipments by both the leading interest and independents promises to be the best of the present year. Current new business is on a higher average price, the bottom on No. 28 gage black sheets having advanced to 1.90c to 1.95c, while galvanized sheets of the same gage are being quoted at 2.95c as a minimum, and 3c as the nominal market, upon which considerable business is being done. Anything below the higher price is for prompt shipment. The Association of Sheet and Tin Plate Manufacturers the past week decided to leave the question of the new roofing sheet form of quotation for the individual manufacturer to dispose of as his customers wished. The sentiment is in favor of the adoption of the new method of quoting roofing sheets by weight instead of area. The demand for roofing sheets has picked up considerably, and a good deal of inquiry is reported. Prices are very firm. We quote the market as follows:

Flat Sheets

Black Sheets

Nos. 10-12, $1.50 to $1.60 per 100 pounds; Nos. 13-14, $1.50 to $1.65; Nos. 15-16, $1.60 to $1.70; Nos. 17-21, $1.65 to $1.75; Nos. 22-24, $1.70 to $1.80; Nos. 25-26, $1.75 to $1.85; No. 27, $1.90; No. 28, $1.90 to $1.95; No. 29, $1.90 to $2.00; No. 30, $2.00 to $2.10.

Blue Annealed

Nos. 3-8, $1.35 per 100 pounds; Nos. 9-10, $1.40 per 100 pounds; Nos. 11-12, $1.45 per 100 pounds; Nos. 13-14, $1.50 per 100 pounds; Nos. 15-16, $1.60 per 100 pounds.

Galvanized

Nos. 10-11, $1.90 to $2.00 per 100 pounds; Nos. 12-14, $2.00 to $2.10; Nos. 15-16, $2.15 to $2.25; Nos. 17-21, $2.30 to $2.40; Nos. 22-24, $2.40 to $2.50; Nos. 25-26, $2.60 to $2.70; No. 27, $2.75 to $2.85; No. 28, $2.95 to $3.00; No. 29, $3.00 to $3.10; No. 30, $3.20 to $3.30.

Roofing Sheets

Galvanized

Net extras on all gages per 100 Pounds.

Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c, 3 V crimped without sticks, 10c; pressed standing seam with cleats, 15c; plain roll roofing with cleats, 15c.

Painted Roofing

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage inc., 15c.

Prices Per Square

28 gage, painted 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 1.30c to 1.35c; 28 gage galvanized, 2-inch, 2½-inch, 3-inch and 5-inch corrugations, 2.45c to 2.55c.

Tin Plate.—There is a stronger tone to the tin plate market. Specifications have increased rapidly against existing contracts, and mills are booked considerably in advance. While new business is quiet, there is sufficient going to indicate a firmer tone and a higher average price, which has become more generally $3.40 per base box, Pittsburgh. There are some mills quoting $3.35, Pittsburgh, for prompt shipment, but there are fewer now than at any time this season, and it is believed that the market will, in a very short time, sustain the higher price. Shipments of tin plate are very heavy and the past month is expected to show the best record of the present season. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.35 to $3.40, f. o. b. mill, Pittsburgh district.

Rails and Track Material.—Specifications are running heavy on standard section rails. Mills are operating to full capacity, but new business for standard sections has not reached the Pittsburgh makers to any extent. On light rails the demand is increasing, and inquiries are coming from coal mining sections and lumber districts for a considerable tonnage at advanced prices, put into effect early in April. The Harriman Lines have placed 1,500 tons of open-hearth rails with the Cambria Steel Co. during the past week, and that company reports its rail operations very satisfactory. Track material is more active and inquiries larger and more numerous, one inquiry for 1,000 tons of spikes coming in this week. Prices are steady for splice bars, tie plates and track material generally, and shipments are increasing as the season advances. The market is quoted as follows, with the base price on steel rails 1.34c per pound at the mills:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.15c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes

4½, 5 and 5½ and 9-16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½ 4 and 4½ x 7/16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x ⅜	.60
2 x 5-16	.80

Steel.—A sale of sheet bars at $20.50, Youngstown, the past week for Pittsburgh delivery was apparently the last to be made at that price and cannot be duplicated. Leading producers are quoting $21, Youngstown, for billets and sheet bars for delivery in the second quarter, and $22, Youngstown, and $23, Pittsburgh, for small billets and sheet bars for delivery in the third quarter. Practically all of the leading producers are sold ahead, and are extremely firm in their prices. Quotations on third quarter billets and sheet bars are not numerous, but there have been some sales, and the market seems to be ready to absorb a good tonnage so soon as the price becomes firmly established. A number of the larger billet and sheet bar manufacturers look for a great scarcity in steel, and are conserving their capacity. Forging billets are very strong at $28, Pittsburgh. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $20.50 to $21.00, with the usual extra for size and analysis, and open-hearth rolling billets, $20.50 to $21.00; Bessemer sheet and tin bars are quoted at $21.00 to $22.00, and open-hearth sheet bars are quoted at $21.00 to $22.00, f. o. b. Pittsburgh, for second quarter, with full freight to destination added. Forging billets are quoted at $28, Pittsburgh.

Hoops and Bands.—There is little change in the demand for hoops and bands. New business is very quiet, but specifications continue to run heavy and shipments satisfactory. The market is firm at 1.25c to 1.30c for hoops, and 1.20c for bands. Mills are operating nearly to capacity, and the production for the past month is expected to compare favorably with any month of the past year. We quote the market as follows:

Hoops in carload lots, 1.25c to 1.30c, Pittsburgh; in less than carload lots, 1.40c; bands 1.20c, base, with net extras, as per standard steel.

Merchant Bars.—New business in merchant bars is quiet, as was expected with the advance in price, but specifications against contracts are extremely heavy, and the bar mills are busier than for many months. As a large number of buyers are now covered for some time ahead on the basis of 1.15c, it is not expected that merchant bar buying will assume any important proportions for some time. Independent makers are well supplied with tonnage, and the chief source of interest is getting specifications regularly in order to distribute the demand over as long a period of contract time as possible. Steel shafting is showing some signs of improvement, and prices are a little firmer, but the manufacturers are still able to take considerable business and are offering the same concessions as have ruled during the past several weeks. The iron bar trade has gained slightly in volume, and the price is more nearly 1.35c than for some time, although some business is still going on the basis of 1.30c, Pittsburgh. We quote the market as follows:

Common iron bars, 1.30c to 1.35c, Pittsburgh; Bessemer and open-hearth steel bars, 1.20c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled and ground shafting, 65 per cent off in carloads and 60 and 10 per cent in less than carloads, delivered in base territory.

Muck Bar.—The demand for muck bar is still a negligible factor of the market. The advance in gray forge iron prices has stiffened the price by leading producers, but they are not selling much and report the market so barren of new business that it would be impossible to test the market on the present basis for buying. We quote, however, $28 to $29, Pittsburgh.

Structural.—There are better inquiries for structural material, and a large

amount of new business is being placed which has filled up the mills, and also made the fabricators unusually busy. Prices are very firm and are growing stronger, and from the inquiries now in hand, it is believed there will be some difficulty in getting prompt shipments for some time ahead. Structural mills in the Pittsburgh territory, including central Pennsylvania, are from 30 days to six weeks behind on deliveries, and are accepting new business only under these conditions of delivery. Railroad bridge work includes 1,600 tons for the Chicago & North Western to the American Bridge Co., and an additional 5,500 tons for the King Bridge Co. The Pittsburgh & Lake Erie railroad is expected to award its contract for elevating its tracks through Youngstown in a few days. It will require a large amount of reinforced concrete and steel construction. General building contracts are also coming out with the advancing season, and are keeping the estimators busy in the immediate district of Pittsburgh. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.25c; tees, 1.25c; angles, from 3 to 6 inches, 1.25c; over 6 inches, 1.35c; universal and sheared, 1.30c; over 15 inches, 1.35c; plates, 6¼ inches wide and wider, 1.35c.

Merchant Pipe.—The past week has been one of unusual activity in the pipe trade, but the business has been more in the aggregate than in individual orders. A number of the larger consumers of pipe in the Pittsburgh territory who have placed large orders in the past, supplemented their original contracts with additions which represent a comfortable volume in themselves. The leading interest has taken one order of 22 miles of 16-inch steel line pipe for shipment into West Virginia for Standard Oil interests. The same buyer is figuring on an additional order of about 25 miles for Pennsylvania delivery in the immediate future. Buying in car load lots of line pipe has been extremely active and in the aggregate represents a large tonnage. The average operations of the pipe mills both of the leading interest and independents have increased and shipments are much better, while prices are generally stronger. Merchant pipe is more active, and buying much improved than for some months. We quote the official discount to jobbers subject to the usual preferential discount to the larger buyers as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch.....	74	54	68	48
⅜ inch	75	65	69	53
½ inch	78	68	72	59
¾ to 1¼ inch.....	81	73	75	64
2 to 3 inches.....	82	75	76	65
	Lap weld.			
2 inches	79	72	72	63
2½ to 4 inches.....	81	74	74	66
4½ to 6 inches.....	80	72	73	65
7 to 12 inches.....	77	68	71	61
13 to 15 inches.....	55	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅜, ¼, ⅜ inch.....	70	60	65	55
½ inch	75	69	70	63
¾ to 1¼ inch.....	79	73	74	65
2 to 3 inches.....	80	74	75	66
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	76	70	71	63
2½ to 4 inches.....	81	74	74	66
4½ to 6 inches.....	77	71	72	65
7 to 8 inches.....	70	60	65	55
9 to 12 inches.....	65	55	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	65	59	60	52
¾ to 1¼ inch.....	68	62	63	55
2 to 3 inches.....	70	64	65	57
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	66	60	61	52
2½ to 4 inches.....	68	62	63	57
4½ to 6 inches.....	67	61	62	56
7 to 8 inches.....	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes.—There is much improvement in specifications against contracts for boiler tubes, and makers' mills are running on better schedules than for many months. Prices are very firm, and there is more new business being taken than has been the case since the demand for boiler tubes showed the first improvement stated. Locomotive boiler tubes are particularly active in demand and the general trade is much stronger, with prices throughout the entire list being held more firmly to the official discount card. The official discounts on charcoal and iron boiler tubes follow:

Steel

1¾ to 2¼ inch.....	65
2½ inch	67½
2¾ to 3¼ inch.....	72
3½ to 4½ inch.....	75
5 and 6 inch.....	67½
7 to 13 inch	65

Charcoal Iron

1½ inch	48
1¾ to 2¼ inch.....	50
2½ inch	55
2¾ to 5 inch.....	60

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—New business in wire is improving at the higher prices established, and specifications on old contracts are more liberal and have allowed the manufacturers to increase their operations to practically 100 per cent of their capacity. The mills are running mostly on contracts taken on the $1.55 basis. Wire nails at $1.60, Pittsburgh, however, are moving a little better, and there is a more uniform holding to this price. The market for plain wire has also improved, and shipments are increasing. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.60; retailers' carload lots, $1.60 to $1.65; cut nails (western makers), jobbers' carload lots, $1.55 to $1.60, painted barb wire, jobbers' carload lots, $1.60; retailers' carload lots, $1.65 with 30c for galvanizing; plain wire to jobbers in carloads, $1.40; and to dealers, in carloads, $1.45; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—The demand for wire rods has been strong, and prices have shown signs of advancing during the past week, the old price of $25.50 to $26 having been more or less unsettled by the insistence of makers that shipments be taken during second quarter on present quotations. Some of the leading producers are so well booked up that they are asking 50 cents a ton higher and stipulate shipments must be before July 1. Very few makers will quote on the third quarter as yet. We quote $25.50 to $26.50, Pittsburgh, for Bessemer and open-hearth wire rods for second quarter delivery.

Coke.—The coke market fluctuated more or less during the past week, but with variations very slight, and offerings of spot coke, if not taken at $2.50 ovens, were generally withdrawn and turned into contract shipments. Prices this week have shown a firmness that is surprising to a number of the larger consumers, who have continually predicted that with better weather and labor conditions, values would decline. A large sale of coke aggregating 10,000 tons for May delivery at $2.50, ovens, with other sales at $2.60 seemed to have pegged the market at not less than $2.50. The larger producers are holding firmly to $2.50, ovens, as a minimum. There is still considerable negotiating on the contract price for coke, and while no contracts have been closed so far as known, the asking price has been around $2.50 for last half delivery. A number of furnaces are attempting to get under this market condition, making the announcement that unless this is possible they will be compelled to blow out their stacks because of the present price of pig iron making it unprofitable to operate. During the past week production increased, but was not up to expectations, and the demand has been more than sufficient to absorb the gain in tonnage. The actual market for spot coke is not, however, gaining, but is rather quieting down because producers are making more generous shipments on contracts, and are

winding up their contract obligations before the end of the half year term. *The Connellsville Courier* reports for the week ending April 20, a total of 32,345 ovens active, and a production of 396,320 tons as compared with 32,372 ovens active and a production of 363,289 tons for the preceding week. The gain was mainly in furnace coke. We quote standard Connellsville furnace coke at $2.50 to $2.60, ovens, for prompt shipment, and on contract nominally $2.25 to $2.40. For standard Connellsville foundry coke for prompt shipment, we quote $2.75 to $3, and for contract, $2.75 to $2.90, ovens.

Old Material.—The demand for heavy melting steel has shown considerable improvement during the past week, and some of the larger consumers who have been resisting the upward tendency of prices entered the market for considerable tonnage. Some sales were reported at $13.50 for heavy melting steel, and a round lot was closed at $13.25, while some of the larger dealers paid the same price for considerable tonnage. Borings and turnings are scarce, and are 25 cents a ton higher, the normal supply of the Pittsburgh territory having been severely curtailed because of the eastern market absorbing its own production, and Michigan and Indiana, also a source of supply, finding other outlets to the middle west points. The Pennsylvania railroad this week is taking bids on 20,000 tons of miscellaneous scrap in the yards and shops of the lines east of Pittsburgh, and also on 20,000 tons of old steel rails and about 600 tons of old iron rails. Other grades of scrap are in fair demand, and prices are very firm. We quote gross tons delivered in the Pittsburgh district including Monessen, Brackenridge, Steubenville and Follansbee as follows:

Heavy melting scrap	$13.25 to 13.50
Rerolling rails	13.50 to 14.00
Malleable	12.00 to 12.50
Bundled, sheet scrap	11.00 to 11.50
Iron axles	22.00 to 22.50
Old iron rails	15.00 to 15.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.50 to 13.00
Low phosphorus	15.00 to 15.25
Machine shop turnings	10.00 to 10.50
Cast borings	10.00 to 10.25
No. 1 cast scrap	12.75 to 13.00

CHICAGO

Sellers Market Prevails---Mills Busy

Office of THE IRON TRADE REVIEW,
1328 Monadnock Blk., April 30.

For the first time in two years, a purely seller's market exists in the west. Practically every mill in this territory is provided with a sufficient tonnage to keep it running for 60 days, even if no further specifications were received Most buyers are now covered for their early requirements and the belated ones are learning that for the present at least it is impossible to obtain concessions in prices. Steel bar buying by agricultural implement makers is practically concluded and new business shows a falling off, although specifications in most cases continue heavy. One prominent eastern independent interest has instructed its Chicago office to accept no additional tonnage, even at the prevailing prices, without confirmation from the home office. Recent car orders have been satisfactory and prospects for additional business in this direction are exceptionally bright.

Pig Iron.—There has been an appreciable stiffening of prices during the past ten days, especially on northern iron, which is now generally quoted $14.50, Chicago furnace, for delivery over the remainder of the year. The heavy buying movement in southern iron has subsided, leaving no inquiries of consequence in the market at present. There is still considerable northern foundry and malleable tonnage pending, including an inquiry for 1,500 tons of malleable from a Wisconsin foundry and another for 3,000 tons from an East St. Louis shop. A Chicago manufacturer of car wheels is also in the market for a round tonnage of low phosphorus iron. The Railway Steel Spring Co. is understood to have purchased 6,000 tons of basic for delivery at its Chicago Heights plant, at a price said to net $14, Chicago furnace. Recent sales of southern iron include 1,500 tons of No. 3, purchased by a Peoria implement manufacturer for last half shipment, at $10.50, Birmingham; 1,000 tons of No. 2 taken by a Chicago interest and 950 tons of No. 2 placed with three separate foundries in the Milwaukee territory. The Chicago Steel Foundry Co. has bought 400 tons of low phosphorus iron. On southern iron for the rest of the year, $11, Birmingham, is becoming more frequent, although certain Tennessee interests are still quoting $10.75 for the third quarter and $10.50 for immediate shipment.

The following prices are for Chicago delivery, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces.

	Third quarter.	Last half.
Lake Superior charcoal	$15.50	15.75
Northern foundry No. 2	14.50	14.50
Southern foundry No. 2	15.10	15.35
Southern silv'ries, 5 per cent sil.	16.10	16.35
Jackson co. silveries, 8 per cent	17.40	17.90
Malleable Bessemer	14.50	14.50
Alabama basic	15.10	15.35

Billets.—The demand for crude steel is so great in the Chicago district that the mills have practically no billets for sale. Consumers are, therefore, dependent on the eastern market and prices are correspondingly high. We quote open-hearth forging billets, $28; re-rolling billets $23, Chicago.

Merchant Bars.—Some of the bar iron mills are now sold up for two months in advance and prices are about $1 a ton higher; the minimum at present appears to be 1.20c, Chicago, although some tonnage is being taken at 1.25c. Most of the new business is from car builders. Agricultural implement makers have practically concluded their purchases for this year and the buying movement in steel bars has subsided. Steel bar specifications are satisfactory, although the last two weeks in April showed a falling off of about 5 per cent compared with the first half of the month. There is a good demand for rivets in this territory, current quotations on those 1½ inches and larger in diameter being 1.68c, Chicago. The demand for merchant steel out of stock continues moderately good.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.20c to 1.25c; hard steel bars, rerolled, 1.18c to 1.22c; soft steel bars, bands and small shapes, 1.38c base; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 65 per cent off list for carload lots, 60 per cent off for less than carloads.

On iron and steel from local stocks, we quote as follows:

Bar iron, 1.50c to 1.60c per pound base;

soft steel bars, 1.55c to 1.60c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material. — Prices are very firmly maintained, but there has been very little tonnage placed at the new quotations. Specifications on old contracts continue heavy. One large eastern independent company has instructed its Chicago office to accept no additional tonnage until the orders have been submitted to the mill for approval. This company has more business at present than it can conveniently take care of. Contracts are about to be let for the new Butler Brothers building, Chicago, which will require 10,000 tons of shapes. About 8,000 tons of steel for this building will be Bethlehem sections. The Morava Construction Co. has been awarded 2,074 tons for a building by the Marshall Field estate, Chicago; about half of this will be Bethlehem and the remainder standard shapes. The American Bridge Co. has taken 427 tons for transmission towers from the Utah Light & Railway Co., Salt Lake City, and 115 tons for bridges from the Kansas City Southern Railway Co. The St. Louis, Peoria & Northwestern Railway Co. has ordered 556 tons of shapes for trusses and cylinder piers at Pekin, Ill. The Midland Bridge Co. has taken 496 tons for various bridges. The other contracts reported in the Chicago market recently are as follows: Cedar river bridge, 829 tons, let by the Chicago, Milwaukee & St. Paul Railway Co., to the Fort Pitt Bridge Co., and a mercantile building for C. W. Wall, St. Louis, 376 tons, to the Noelke-Richards Iron Works.

We quote, mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.43c. For extras, see Pittsburgh report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.60 to $1.65 per 100 pounds; angles over 6 inches, $1.70 to $1.75 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.60 per 100 pounds, base; channels, 3 inches and larger $1.60 per 100 pounds, base.

Rails and Track Fastenings.—There have been no noteworthy changes in the rail situation recently. It is understood that the inquiry from the St. Louis & San Francisco, which was mentioned last week, covers from 20,000 to 25,000 tons. The Pere Marquette is soon expected to be in the market for 4,000 tons of 90-pound rails. The demand for track supplies is growing and is expected to increase until the usual spring business is taken care of.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 25 to 45-pound, 1.20c to 1.25c; 16 to 20-pound, 1.25c to 1.30c; 12-pound, 1.30c to 1.35c; 8-pound, 1.35c to 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.55c to 1.60c, smaller size spikes, 1.65c, base; track bolts with square nuts, 1.95c to 2.05c base.

Plates.—Most mills are unable to give deliveries on plates inside of six weeks. There has been practically no new tonnage placed since the advance to 1.43c, Chicago, but on account of the heavy contracting which immediately preceded the increase in price, it is not expected that there will be another buying movement for about 60 days. The Santa Fe has ordered 1,000 box cars from the Standard Steel Car Co., 500 box cars, 25 ore cars and 50 passenger coaches from the Pullman Co.; 1,000 box cars, 250 automobile cars, 500 furniture cars and 200 tank cars from the American Car & Foundry Co.; 50 air pump cars from the Western Wheeled Scraper Co., 1,000 refrigerator cars and 500 box cars, together with 100 flat cars from the Western Steel Car Co., making a total of 5,175. The Harriman lines have purchased 146 passenger cars from the Pullman Co. The Kansas City Southern is in the market for 1,500 box cars, 1,000 all-steel gondola cars, 400 flat cars and 100 automobile cars. The Lake Superior & Ishpeming has ordered 50 flat cars from the Western Car & Foundry Co. Negotiations for the Harriman freight cars are under way and it would not be surprising if as many as 14,000 were purchased.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6½ to 100 inches wide, 1.43c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.60c.

Sheets.—The sheet tonnage coming to the western mills continues very heavy and no progress is being made toward earlier deliveries. Nevertheless, there is some irregularity in the market and the latest prices are not being strictly maintained. Only a minority of the tonnage is involved in these lower quotations.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 1.90c; No. 12, 1.95c. Box annealed, No. 28, 2.30c. Galvanized, No. 28, 3.45c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—While business is slow, having been retarded with the general backwardness of spring, prices are firm, largely through the sympathetic influence of quotations on other steel products. New business in nails is not large.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.78; retailer's carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—Pipe prices are being well maintained and the demand is a little better. Jobbers are urging the mills for shipments, which seems to indicate that their stocks are more or less depleted. The boiler tube market is showing a steady improvement. Prices are firm but considerably more tonnage could be handled by the western mills.

We quote store prices on merchant pipe and tubes, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	71.2	50.2	63.2	42.2
⅜ inch	75.2	64.2	68.2	52.2
½ inch to 1½ inch..	78.2	69.2	71.2	59.2
Lap.				
2 inch	76.2	68.2	68.2	58.2
4½ inch to 6 inch..	77.2	68.2	69.2	60.2
Card Weight.				
7 inch to 12 inch...	74.2	63.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	66.2	54.2	60.2	48.2
½ inch	71.2	59.2	65.2	53.2
2 inch to 3 inch....	76.2	64.2	....	....
Lap.				
2 inch	72.2	60.2	66.2	54.2
7 inch to 8 inch....	66.2	54.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	59.2	47.2	....	....
¾ inch to 1½ inch.	62.2	50.2	....	....
Lap.				
2 inch	60.2	48.2	....	....
4½ inch to 6 inch..	61.2	49.2	....	....
7 inch to 8 inch....	54.2	42.2	....	....

Tubes.

	Lap weld steel. Per cent.	Charcoal iron. Per cent.	Shelby seamless. Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch.....	55	40	35
2¾ to 3¼ inch.....	65	50	46
3½ to 4½ inch.....	67½	50	46
5 to 6 inch.....	55	..	..

Cast Iron Pipe.—There were no large lettings recently. The villages of Hamilton, Morton Grove and Ashton, Ill., last week purchased a total of 1,000 tons of pipe from the leading interest. Bids will be opened at Cleveland, May 6, for 3,000 tons. Awards will be made on May 9 at Mitchell, S. D., for 7,500 feet of 4, 6 and 10-inch water pipe.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $27.00, 6 to 12 inch-

es, $25.00, larger sizes, $24.50; gas pipe, $1 a ton higher.

Old Material.—The advance in prices on scrap which has been continuous for practically a month, seems to have been checked and no special changes in quotations occurred during the week under review. The market is moving along easily and displays no weakness. Shipments are heavy and railroad lettings during the week have been large. The Rock Island opened bids April 29 on 2,500 tons, including 200 tons of rerolling rails. The consumption of heavy melting steel is apparently keeping pace with the demand and the same may be said of wrought scrap. Re-rolling rails are plentiful, large tonnages having recently been offered by railroads.

The following prices represent the market for delivery in consumers' yards, Chicago:

Gross Tons.

Old car wheels	$13.25 to 13.75
Old iron rails	15.75 to 16.25
Rerolling rails (5 ft. and over)	12.50 to 13.00
Old steel rails (3 ft. and under)	11.75 to 12.25
Frogs, switches and guards	12.00 to 12.50
Heavy melting steel	12.00 to 12.50
Shoveling steel	11.00 to 11.50

Net Tons.

No. 1 R. R. wrought	$12.50 to 13.00
No. 2 R. R. wrought	11.50 to 12.00
Arch bars and transoms	14.50 to 15.00
Knuckles, couplers and springs	11.50 to 12.00
Shafting	14.50 to 15.00
Iron car axles	19.00 to 19.50
Steel car axles	15.75 to 16.25
Locomotive tires	13.50 to 14.00
Dealers forge	10.25 to 10.75
Pipe and flues	9.00 to 9.50
No. 1 cast	12.00 to 12.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	7.25 to 7.75
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.50 to 13.00
Cast and mixed borings	6.50 to 7.00
Machine shop turnings	7.25 to 7.75
Railroad malleable	11.50 to 12.00
Agricultural malleable	9.75 to 10.25
Angle bars, splices, etc., iron	13.50 to 14.00
Angle bars, steel	11.00 to 11.50
Stove plate and light cast scrap	10.00 to 10.50

CINCINNATI

Pig Iron Prices Are Hardening

Office of THE IRON TRADE REVIEW.
503 Mercantile Library Bldg., April 30.

Pig Iron.—Several interests which have been selling southern No. 2 foundry iron on a $10.50, Birmingham, basis, have notified the market here that this price has been withdrawn and that $11 is now the lowest quotation on this grade for both spot and third quarter shipment. Other dealers, however, who also have been asking the $10.50 price, are offering their iron for $10.75 for delivery until July, and $11 to $11.50 for any time after that date to the end of the year. Most contracts, though, that are being closed at the present time, do not extend beyond the third quarter. It is hardly probable that the $10.50 iron has entirely disappeared and some grades can still be had at this price, although not enough to have much of an effect upon the market. Buyers at this price, therefore, would be limited to certain brands, and would not have much of a variety to choose from. Sales are being made regularly by some local firms on the $11, Birmingham, basis, and they state that they could sell more iron if they had it at their disposal. Business is not being solicited by some furnace interests, especially for the last quarter, as they are well sold up for several months, and prefer to wait until conditions become a little more settled. Last half quotations on three or four brands, which were withdrawn from the market a week or so ago, are still being withheld. A large number of firms here are holding firm at $11, and if buyers desire any of these certain grades, they probably could not get them for anything less. The market as a whole is quiet, sales and inquiries, as a rule, being light, and for small tonnages, but a few fairly large purchases are reported to have been made on the quiet. One local firm reports that it has sold 13,000 tons during the last few days. An Indiana melter recently bought 600 tons of northern, 500 tons of southern and a small tonnage of silvery, and a central Ohio plant has taken about 3,500 tons, the sale being made by a northern producer. This same maker has also taken about 3,000 tons of malleable for shipment to a central Indiana user. There has been some cutting of the market price on northern iron, but this is limited to certain furnaces, and hardly enough is being done to have any effect upon the general quotation, which can still be given as $13.50, Ironton. Sales from that territory lately have been mostly of malleable, the market for foundry iron being quiet. A good feature of the whole local market in general is the fact that several firms here report that their sales for the month of April aggregate a larger tonnage than for a long time. The coke situation is not so encouraging to pig iron makers, as furnace coke is high at present, and will probably remain so for some time, and several furnaces have contracted for some large tonnages of iron to be made during the next six months at prices that would handicap them if those on coke were to be advanced, or in some cases, even remain at the present level. With freight rates $3.25 from Birmingham and $1.20 from Ironton, we quote Cincinnati prices as follows:

Southern foundry No. 2	$14.00 to 14.25
Southern foundry No. 3	13.50 to 13.75
Southern foundry No. 4	13.00 to 13.25
Southern gray forge	12.50 to 12.75
Mottled	12.25 to 12.50
Southern No. 1 soft	14.25 to 14.50
Southern No. 2 soft	13.75 to 14.25
Standard southern car wheel	25.25 to 25.50
Northern No. 2 foundry	14.70
Northern No. 3 foundry	14.20
Northern No. 4 foundry	13.95 to 14.20
Jackson co. 8 per cent silicon	16.45 to 16.95

Coke.—The coke market is rather firm, and although definite prices are uncertain, they have hardly changed to any extent during the past week. Some fairly good contracts have been placed on both furnace and foundry grades, but producers are limiting these in some instances because of the uncertain outlook. There have been about 15,000 tons of furnace coke sold in this territory during the past few days, and some of the contracts on certain foundry grades on which dealers have not been limited by the oven interests, extend on through the last half of July of next year. Some makers who are so situated that they can take advantage of the coal strike in England are exporting their coal instead of turning it into coke. Labor in the coke fields is scarce, which is limiting production to a certain extent. It is predicted by some dealers that certain pig iron furnaces may suffer as a result of the fact that they have contracted for large tonnages of iron to be delivered before the end of the year, and it is doubtful, if conditions in the coke fields do not improve, whether sufficient coke can be furnished them at a price that will justify the making of the pig iron at the figure for which the contracts have been closed. We quote prices

from the leading coke producing districts as follows:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.75 to 3.00	$2.50 to 3.00
Furnace coke	2.40 to 2.50	2.40 to 2.50
Wise county district:		
Foundry coke	$2.50 to 3.00	$2.50 to 3.00
Furnace coke	2.15 to 2.25	*Sliding [scale basis
Pocahontas district:		
Foundry coke	$2.75 to 3.00	$2.75 to 3.00
Furnace coke	2.50	2.50
New river:		
Foundry coke	$2.75 to 3.00	$2.50 to 3.00
Furnace coke	2.25 to 2.50	2.15 to 2.40

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—The local sheet market is firm, and the local mill reports a good business. Prices are as follows, all f. o. b. Pittsburgh basis: Black sheets, No. 28, 1.95c, and galvanized sheets, No. 28, 3c. Plans for the new Gibson House, this city, have been finished, and bids will be received until May 20. About 3,000 tons of steel will be required. For mill quotations see Pittsburgh report.

Warehouse business has improved somewhat during the past few days, and while prices have not been advanced as yet, it is very probable that this will be done before the end of the present week, following the action already taken by warehouse interests in surrounding cities. We quote unchanged prices as follows, f. o. b. Cincinnati:

Steel bars, 1.60c base; iron bars, 1.55c to 1.60c base; structurals, 1.70c base; plates, ¼ inch and over, 1.70c base; sheets, blue annealed, No. 10, 1.90c base; rivets, cone head, 2.25c base; cold rolled shafting, 60 per cent discount; boiler tubes as follows: 1¾ to 2¼ inch, 61 per cent discount; 2½ inch, 63 per cent discount; 2¾ to 3¼ inch, 66 per cent discount; 3½ to 4½ inch, 68 per cent discount; and 5 to 6-inch, 61 per cent discount; and soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.70c; ⅝ inch square and larger, 1.80c; ½ inch square and larger, 1.90c; ⅜ to ¾ inch square and larger, 2.10c; ¼ inch square and larger, 2.20c to 2.30c.

Old Material.—The scrap iron market is unchanged, and prices are holding to the higher level to which they were placed a week or so ago. Dealers do not seem to be any too anxious to sell, and as a general rule, are refusing all business except at regular quotations. A recent sale of re-rolling rails was made at $11.25, and one dealer reports having bought cast borings at $6. We quote prices dealers will pay as follows:

Gross Tons.

Old iron rails	$13.00 to 14.00
Old steel rerolling	11.00 to 11.50
Old iron axles	19.00 to 19.50
Steel melting scrap	10.00 to 10.50
Car wheels	10.50 to 11.00
Bundled sheet scrap	8.50 to 9.00

Net Tons.

Old No. 1 R. R. wrought	$10.25 to 11.25
No. 1 machinery cast	10.00 to 11.00
No. 1 busheling	8.50 to 9.00
Stove plate	7.00 to 8.00
Machine shop turnings	6.25 to 7.25
Cast borings	6.00 to 7.00
Heavy turnings	6.25 to 7.25
Mixed cast	8.25 to 9.00

CLEVELAND

Coke Shortage Delays Blowing in of Furnaces

Office of THE IRON TRADE REVIEW.
Penton Bldg., April 30.

Iron Ore.—Ice still interferes somewhat with the movement of vessels, but two cargoes have been received at Toledo and Ashtabula from Escanaba. A few vessels have sailed from the head of the lakes with ore and it is expected that fully a hundred steamships will start on their first trips before the close of the week. The Pittsburgh Steamship Co. have made charters for moving about 7,000,000 tons of ore in addition to the tonnage which it will move in its own bottoms. The ore unloading charge has not yet been announced by the Interstate Commerce Commission, and there is some doubt concerning the authority of the commission to fix the rate, but it is probable that if a rate is suggested by the commission, it will be adopted by the dock companies. The principal difficulty is in deciding upon a rate which will be satisfactory to the shippers, and, at the same time, to the different dock companies, some of whose equipment is much more modern than that of others. Very little ore is being sold. The movement from docks to furnaces is rather slow, as a disposition is being shown to await the arrival of new ore which has been sold at the reduced prices and can be sent forward directly to furnaces.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $3.75; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.05; Mesabi non-Bessemer, $2.85.

Pig Iron.—A very fair number of inquiries, ranging from two to three carload lots to 500 to 600 tons, have been received, but no very large inquiries have come from the immediate Cleveland district. We quote, delivered in Cleveland, as follows, the higher quotations, when given, being for the last half, while the lower quotations are for the first half of the year:

No. 1 foundry	$13.50 to 14.00
No. 2 foundry	13.00 to 13.50
No. 2 southern	14.85 to 15.30
Gray forge	12.50 to 12.75
Bessemer	15.15
Lake Superior charcoal	15.50 to 16.00
Jackson co. 8 per cent silvery	17.05

Coke.—A number of furnaces would be glad to blow in if they could obtain satisfactory contracts for coke. It is generally recognized that the present production of coke is as great as it can be made for several months, and that the output is just about equal to the demand. Hence, it is not expected that the price of furnace coke will be lower. On account of the heavy stocks foundries laid in owing to fear that there would be a strike of coal miners, some foundries find that they have more coke on hand than they will require, and in some cases foundry coke has been diverted to furnace uses. Scarcity of stock coke continues and the usual quotation is $1.65. The scarcity is attributed to the fact that during the cold weather unusually large quantities of stock coke were used for heating purposes, and also to the fact that owing to the active demand for coke the culling has not been as carefully done as when the demand is slack. We quote:

Connellsville furnace coke, $2.50 to $2.65 for prompt delivery, and $2.40 on contract; Connellsville foundry coke, $2.75 to $3.00 for prompt, and $2.75 to $2.90 on contract.

Finished Material.—The recent advances in the prices of bars, shapes and plates are being well maintained, but owing to the extremely heavy contracting immediately before the advances became effective April 20, there is very little buying at the higher prices. Specifications are, however, strong and general conditions are satisfactory with outlook favorable for an active summer. The recent advance of 2½ per cent on prices of bolts and nuts is being maintained and plants are fully active.

The Berger Mfg. Co., Canton, O., has awarded the contract for 800 tons of steel for its new building to the Canton Bridge Co.

D. H. Burnham & Co., Chicago, will take bids on April 27 for 2,500

tons for the Second National Bank building, Toledo, O.

Old Material.—Quantities of country scrap continue to come into Cleveland dealers' yards with the result that all grades of material are piling up. Dealers' ideas of prices, however, are higher than consumers' and little actual business is being done. Heavy steel users are not buying and rolling mills are still not interested in present prices. While some stock is being moved on old contracts yet the local market in general shows little life. We quote, gross tons, f. o. b. Cleveland, as follows:

Gross Tons.

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	11.25 to 11.75
Old steel rails (over 6 ft.)	11.50 to 12.00
Relaying rails	19.50 to 20.00
Old car wheels	11.50 to 12.00
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.00 to 11.50
Steel axles	17.00 to 17.50
Axle turnings	8.50 to 9.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	11.00 to 11.50
Country mixed steel	9.00 to 9.50
Bundled sheet scrap	7.50 to 8.00

Net Tons.

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	10.75 to 11.25
No. 1 dealers' wrought	9.00 to 9.50
Machine shop turnings	7.25 to 7.50
Pipes and flues	8.00 to 8.50
Wrought drillings	7.25 to 7.50
Stove plate	9.00 to 9.50
Cast borings	7.00 to 7.25
Wrought iron piling plate	15.50 to 16.00
Wrought iron arch bars	14.50 to 15.00
Re-rolling rails (5 ft. and over)	13.25 to 13.75
Old steel rails (3 ft. and under)	12.25 to 13.25
Light section relayers (45 lb. and under) subject to inspec.	21.50 to 22.50
Re-laying rails, subject to inspec.	22.50 to 23.25
Frogs, switches and guards	10.50 to 11.25
Heavy melting steel	11.50 to 12.25
Shoveling steel	10.75 to 11.25

Net Tons.

No. 1 railroad wrought	$11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Arch bars and transoms	14.25 to 14.50
Knuckles, couplers and springs	10.50 to 11.00
Shafting	14.00 to 14.50
Iron car axles	18.50 to 19.00
Steel car axles	16.00 to 16.50
Locomotive tires	11.50 to 12.00
No. 1 country wrought	9.25 to 9.75
Pipe and flues	8.50 to 9.00
Tank iron and cut boilers	7.50 to 8.00
No. 1 cut busheling	9.25 to 9.75
No. 2 cut busheling	6.35 to 7.55
Cast and mixed borings	6.25 to 6.50
Machine shop turnings	7.00 to 7.25
Railroad malleable	10.50 to 11.00
Agricultural, malleable	9.50 to 10.00
Stove plates	9.50 to 10.00
Angle splice bars (iron)	11.25 to 12.00
Angle splice bars (steel)	9.50 to 10.00

Air Brake Capital Increased.—A proposition to increase the capital stock of the Westinghouse Air Brake Co from $14,000,000 to $20,000,000 and to list the shares of the corporation in the New York stock exchange was approved by stockholders at Wilmerding, Pa., April 24. Following the action of the stockholders, directors declared the stock dividend of 33 1-3 per cent, payable July 10. This stock dividend will be the second the company has paid. It is announced that the new stock represents the actual increase in assets. The balance of the new stock not issued for dividend purposes will be used for extensions and improvements to plant and properties as may be necessary.

ST. LOUIS

Pig Iron Prices Firm—Urgent Demand for Shipments

Office of THE IRON TRADE REVIEW.
St. Louis, April 30.

Pig Iron.—The market for pig iron is very firm in the St. Louis district, consumption is heavy, and the demand for shipments on contracts is urgent. Inquiries are in the market for 3,000 tons of malleable for last half delivery, and for small lots totalling perhaps another thousand tons. Sales reported the latter part of last week were 500 tons of southern No. 2 and 3, 1,000 tons of southern No. 2, 300 tons of southern No. 2, scattering orders for perhaps 700 tons, and a reported sale of 5,000 tons of northern pig, which is confirmed by some and denied by others. Southern No. 2 is firm at $11, Birmingham, and some sales have actually been made at $11.50. Northern iron is firm at $13.50, Ironton.

Our tabulated prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$15.25
Southern No. 2	14.75
Southern No. 3	14.25
Southern No. 4	13.75

Coke.—Very little inquiry is in the market, but a sale of 6,000 tons of northern foundry, reported to have been made Friday, seems to have stimulated conditions.

Our quotations on coke remain at:

We quote 72-hour Connellsville foundry grades, $2.50 to $2.65 for second quarter of 1912; 72-hour foundry, $2.25 to $2.50 on tracks and $2.75 to $2.85 for immediate delivery; 48-hour Connellsville furnace, $2 to $2.25; best 72-hour Virginia foundry, $2.50 to $2.75; 48-hour Virginia furnace, $2 to $2.25. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—Bars are quoted at 1.20c, Pittsburgh, and plates and structural material at 1.25c, Pittsburgh. Inquiries are numerous.

Old Material.—Transactions in scrap dragging, and prices are unchanged as follows:

Gross Tons.

Old car wheels	$13.50 to 14.25
Old iron rails	15.25 to 15.50

BUFFALO

Heavy Buying of Foundry Pig Iron

Office of THE IRON TRADE REVIEW,
Buffalo, April 30.

Pig Iron.—The heavy buying movement which began early in the month, reaching its largest tonnage a week ago, was maintained through the past week. Orders for fully 45,000 tons of foundry grades, including malleable, were placed and in addition to this, about 12,000 tons of basic were booked. A considerable tonnage of malleable went to foundries engaged in building cars. Prices have stiffened as a result of the buying. One furnace is holding for $14 on all grades. Another has established $14.50 as a minimum on No. 1X, $14.00 on No. 2X, and $13.75 on No. 2 plain and No. 3 foundry.

The range of prices for the week, f. o. b. Buffalo, is substantially as follows:

No. 1X foundry	$14.00 to 14.50
No. 2X foundry	13.50 to 14.00
No. 2 plain	13.50 to 14.00
No. 3 foundry	13.50 to 13.75
Gray forge	13.25 to 13.50
Malleable	14.00 to 14.25
Basic	14.00 to 14.50
Charcoal	15.50 to 16.00

Finished Material.—The past week has been good in all lines. The mills report specifying on contract, during the week, the heaviest in the past two years. Prices are being maintained firmly at 1.20c, base, on bars, and 1.25c, base, on structural and plate. Little new business has materialized. Mills are cancelling tonnage on contract, where the users are not keeping up to their monthly quotas. This was previously threatened, but now the mills are insisting that specifications come in per contract. Most of the makers are running well up to full capacity and have enough tonnage booked to take this stand.

Old Material.—Local transactions were light during the past week, but the dealers report a slight betterment

of conditions, due to demand for material from outside of the district. The consumers here seem to be stocked, but are expected to soon come into the market. We quote the following range of prices, per gross ton, f. o. b. Buffalo:

Heavy melting steel	$12.75 to 13.25
No. 1 railroad wrought scrap	13.50 to 14.00
No. 1 R. R. and mch. cast scrap	13.50 to 14.00
Old steel axles	16.50 to 17.25
Iron axles	21.00 to 22.00
Car wheels	12.50 to 13.00
Railroad malleable, scrap	12.50 to 13.00
Wr'ght iron and soft steel turn.	8.00 to 8.50
Cast iron borings	7.00 to 7.50
Low phosphorus steel scrap	15.75 to 16.00
Old iron rail	15.00 to 15.50
Tank iron	10.00 to 10.25
Boiler plate, sheared	13.75 to 14.25
Pipe and tank	9.50 to 10.00
Stove plate	9.75 to 10.00
Sheet iron	7.00 to 7.50
Locomotive grate bars	11.00 to 11.25

Ore Line Asks Bond Issue

The Port Bolivar & Iron Ore Railway Co. has filed with the railroad commission of Texas an application for the issuance and registration of $150,000 of bonds needed for immediate purposes. The road is completed from Longview to Ore City, a distance of 30 miles. It reaches ore beds in the northeast corner of Marion county. The company hopes to have the machinery at Ore City in operation soon for mining ore. The docks for loading the ore at Port Bolivar, opposite Galveston, have been completed and await the coming of ore from eastern Texas.

NEW YORK

New England Consumers Buy Pig Iron Liberally

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., April 30.

Iron Ore.—Lake Superior manganate ores have been recently offered in the east at about a 50 cent reduction from the prices prevailing the preceding year and a sale of about 10,000 tons has been made upon this basis, which represents slightly in excess of 7½ cents per unit, delivered, for a 50 per cent material. Another cargo of 800 tons of Venezuelan ore was received at Philadelphia the past week and distributed to several eastern furnaces. Some of this lump ore has been sold to eastern steel works for open-hearth purposes at 9 cents per unit ex-ship. Another small cargo of this ore will arrive in May and it is not expected that much additional ore will be brought in thereafter this year. By next season, however, it is expected that the plant will be in such shape to ship liberally.

Pig Iron.—The buying movement in the territory adjacent to the metropolis has turned sharply in the week to the New England districts where a number of prominent consumers have been inquiring and buying actively. From 20,000 to 25,000 tons of metal, chiefly foundry grades, have been closed during the past week for delivery during the third and fourth quarters to consumers in Massachusetts, Connecticut and Rhode Island. Buffalo furnaces shared heavily in this tonnage, which was booked generally on the basis of $13.50, furnace, for No. 2X, or $15.95, delivered. Smaller lots were sold at $13.75 and $14 at the furnace. A Rhode Island machinery builder took 2,000 tons of high manganese Virginia No. 2X for September and October shipment at $13.75, furnace, which is practically 50 cents above the highest prices recently made on Virginia iron. Other sales of the past few days include 4,000 to 5,000 tons of foundry and charcoal grades to a Connecticut foundry for last half; 3,000 tons of No. 2X for last half to a consumer in Boston territory; about 3,000 tons of No. 2X to a Rhode Island manufacturer of fire apparatus; 3,000 tons of high phosphorus iron to a Massachusetts machinery builder for third quarter to be furnished by an eastern Pennsylvania furnace and other sales. A Connecticut foundry is inquiring for 5,000 tons of No. 2 plain and No. 1 for last half. A New Jersey pipe manufacturer is out for 5,000 tons of forge iron for last quarter and one lot of 5,000 tons of foundry iron for export is pending. The Tennessee Coal, Iron & Railroad Co. has taken about 2,000 tons of Nos. 1, 2 and 3 southern for government delivery to Panama, extending to June, 1913. Lehigh and Schuylkill valley makers, having sold freely for several months ahead, are holding quite firmly for higher prices and some of them are now quoting $14.75 to $15, furnace, for No. 2X for any delivery. A railway equipment manufacturer in Chicago territory has closed through New York offices for 5,000 to 10,000 tons of forward basic at $14, Chicago furnace, or $14.40, delivered, but it is stated that this price could not be duplicated at present. The furnace of the Lebanon Valley Iron Co., at Lebanon, Pa., has been acquired by new interests and will be put in blast after an idleness of several years. We quote for prompt and second quarter shipment as follows, southern and Virginia iron being given at New York docks:

Northern foundry No. 1	$15.20 to 15.45
No. 2X foundry	15.00 to 15.20
No. 2 plain	14.50 to 15.00
No. 2 Virginia	15.80 to 16.05
No. 2 southern foundry	15.00 to 15.25
Malleable	15.25 to 15.50
Gray forge	14.50 to 14.75

Ferro-Alloys.—The second advance in several weeks of $2.50 in the price of ferro-manganese has been announced by English makers, bringing their schedule for forward shipment to $46, Baltimore. Even at this price, the manufacturers show no great willingness to sell and sales generally are being put up to them for confirmation. Some carload sales are reported at the new high price. Preceding the advance, as was the case several weeks ago, there was sizable buying by large consumers on the old basis of $43.50, seaboard. One Pittsburgh interest closed for 3,000 to 4,000 tons for forward delivery on this level and another middle western steel maker is out for 500 to 1,000 tons. Fifty per cent ferro-silicon is moving quietly. We quote standard English ferro-manganese for forward shipment at $46, seaboard, with premium prices ruling on prompt material and 50 per cent ferro-silicon at from $68 to $70, Pittsburgh.

Cast Iron Pipe.—There is still an absence of public letting of size in the eastern district, but the private ordering continues very satisfactory. The city of New York is expected to put out shortly some large inquiries for additional requirements. Prices are showing some hardening, but the low quotations have not been fully eliminated. We quote 6-inch pipe at from $21 to $22, f. o. b.

New York, in carload lots, some makers asking up to $23.

Finished Material.—Delivery conditions have become a more important consideration in iron and steel buying and consumers more apparently are placing their orders where they can get the best promises in this respect. Urgent requests for shipments are accompanying numerous specifications being sent to the mills by consumers. Buyers who are covered by low priced contracts are finding considerable difficulty in some cases to get prompt response to their specifications because of the apparently over-sold condition of some of the larger mills. When confronted with these conditions, they are placing their orders with other makers. The volume of new business being placed is not so heavy in this district, but specifications are very good.

With stress being laid upon deliveries, prices are holding very firmly. In plates and shapes, the market in this district is at a minimum of 1.20c, Pittsburgh, or 1.36c, New York, and requires a good-sized order to bring out these figures. There is a considerable amount of miscellaneous tonnage going at the full asking price of 1.25c, Pittsburgh, or 1.41c, New York. Steel bars appear quite steady on the 1.20c, Pittsburgh, or 1.36c, New York, basis. Eastern bar iron makers are asking from 1.20c to 1.22c, mill, or 1.30c to 1.32c, New York.

In structural lines the principal railroad contract pending is that of about 7,000 tons for coal piers at Norfolk, Va., for the Norfolk & Western railroad upon which bids are now asked. The Boston & Maine railroad is expected to soon enter the market for bridge requirements extending over the year, and it will probably close for from 4,000 to 5,000 tons.

Lettings of the week include 1,300 tons for a grand stand for the Brooklyn Baseball park and 1,100 tons for a highway bridge at North Haddam, Conn., both with the American Bridge Co.; 850 tons for a ferry house at Thirty-ninth street, Brooklyn, and 275 tons for pier 34, North river, for the Lehigh Valley railroad, both to the Phoenix Iron Works; 200 tons to the McClintic-Marshall Construction Co. for a mill building for the Ingersoll-Rand Co., Phillipsburg, N. J.; 900 tons to an independent contractor for the Plimpton loft, Fifty-ninth street and Thirteenth avenue, New York City; 400 tons to Harris H. Uris Iron Works for a loft building at 146th street and Broadway, New York City; and 350 tons to G. W. & F. Smith Iron Co., for buildings for the Roessle Brewing Co., Boston. Bids are in for an apartment at Seventy-ninth street and Park avenue for the Akron Construction Co., to require over 1,000 tons, and have been asked for the Julius Tishman apartment at West End and 101st street, 1,000 tons. An addition to the Prince George hotel, East Twenty-eighth street, this city, 500 tons, is still pending. Plans are being prepared for a 17-story loft for the Carlisle Construction Co., on West Twenty-fourth street.

Bids are being taken from general contractors for a 10-story meter repair shop for the Standard Gas Light Co. at 110th street and Avenue A, this city, to require about 3,200 tons. A building for the Glens Falls Insurance Co., Glens Falls, N. Y., 500 to 600 tons, is being figured. We quote, delivered at New York tidewater, as follows:

Plain structural shapes 1.36c to 1.41c; tank plates, 1.36c to 1.41c; steel bars, 1.31c to 1.36c; common iron bars, 1.27c to 1.32c; plates and shapes from store, 1.70c to 1.80c; extras as shown under Pittsburgh report.

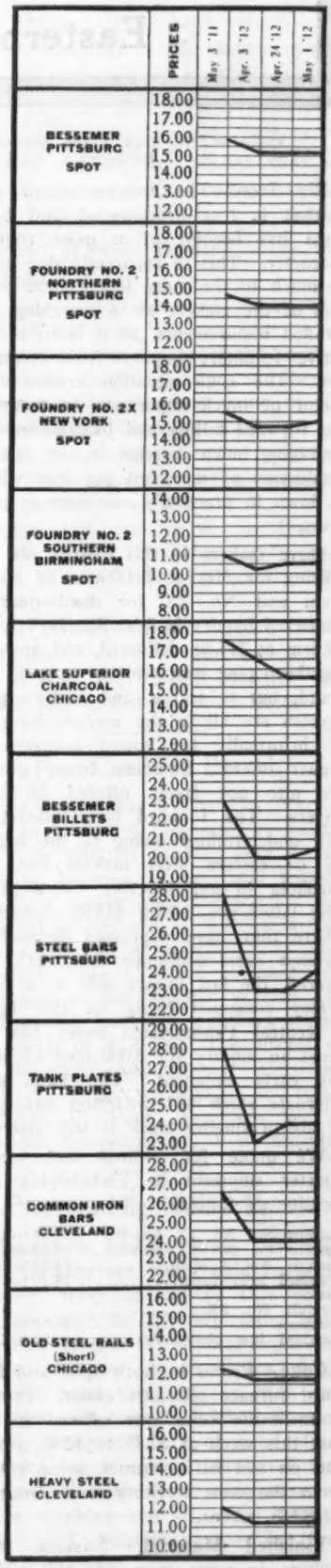
Rails and Track Material.—The St. Louis & San Francisco railroad has entered the market for 35,000 to 40,000 tons of rails for about 450 miles of new construction and this business is expected to go to Chicago mills. The Chicago, Milwaukee & St. Paul railroad has placed 2,000 tons of Mayari Bessemer rails with the Maryland Steel Co. for rolling at Sparrows Point. The Bethlehem Steel Co. has taken 8,000 tons of 60 pound rails for the South African Railway Co. The market for girder rails is rather quiet.

Old Material.—A fair amount of business continues to be done in old material, although some of the eastern steel mills, after having made some large purchases, are now more bearish on conditions. The market appears firm, however, and sentiment is strong, which is leading some yards to reserve some considerable portions of their stocks for higher prices. We quote gross tons, prices New York dealers will pay at tidewater as follows:

Old car wheels	$11.25 to 11.75
Old iron axles	16.50 to 17.00
Old steel shafting	14.25 to 14.75
No. 1 heavy melting steel	11.00 to 11.50
No. 1 R. R. wrought	13.00 to 13.50
Wrought pipe	9.75 to 10.00
Cast borings	6.50 to 7.00
Machine shop turnings	8.00 to 8.50
Heavy cast	11.00 to 11.40
R. R. malleable	9.50 to 10.00
Stove plate	8.25 to 8.75
Grate bars	7.00 to 7.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York.

PRICE CHART



PHILADELPHIA

Eastern Conditions Continue Promising

Office of THE IRON TRADE REVIEW.
Philadelphia, April 30.

Pig Iron.—The movement of the market is less pronounced and business has become of a more routine character. This is apparently due quite as much to the more independent position of the makers as to searching out unfilled requirements, as it is to a less active voluntary inquiry from consumers. The coke situation continues a factor of much importance in restraining forward selling and likewise in discouraging much increase in the eastern production of merchant pig iron which is down to practically minimum proportions.

Stove makers in this district are inquiring for 2,000 to 3,000 tons of No. 2 plain and No. 2X for third quarter. Scattered inquiry is fair. Standard forge is firm at $14.50, delivered, and upward. Northern pipe iron remains in good demand, but is scarce, and eastern pipe makers are all in the market formally or informally for round tonnages at higher offers. Southern lower grades are also not freely offered to local buyers. The forward basic market is still undetermined owing to the inability of eastern steel makers and the furnaces to get together on a price. The latter are asking $15.50, delivered, where they have expressed themselves. Prompt basic continues about $15, delivered, the last known sale to a New Jersey consumer being on this basis. A central Pennsylvania buyer has revised an inquiry for 3,000 tons of basic for early shipment. The large new alternate stack at Swedeland has gone in and a smaller stack is still active.

We quote for prompt and second quarter shipment in Philadelphia and vicinity as follows:

Eastern No. No. 1X foundry	$15.25 to 15.50
Eastern Po. No. 2X foundry	15.10 to 15.25
Eastern No. 2 plain	14.50 to 15.00
Standard gray forge	14.50 to 14.75
Basic	15.00
Virginia No. 2X	15.80
Southern No. 2	15.00 to 15.25
Standard low phosphorus	19.50 to 19.75

Coke.—Prices in both spot and forward furnace coke are easier. Prompt Connellsville coke was offered in the east this week at $2.35 to $2.45, ovens, and on last half contract, some brands from the same territory were tendered at $2.25, ovens.

Finished Material.—Eastern steel makers, in some cases, are still adding to their going capacity. In all instances, operations are well sustained. Heavier steel works operations are reflected in the reduction of cold material, pig iron or steel, on practically all steel works yards. The Alan Wood Iron & Steel Co., this week, lighted a new 500-ton alternate stack at Swedeland, Pa., and continues to operate a second smaller furnace. The sheet mill of this company at Conshohocken, which was idle practically all week because of labor troubles, resumed this week, in full. Open-hearth plants generally in the east are being driven at a higher gait. The incoming tonnage is good and orders are numerous, especially plates. Some dissimilar reports exist in shapes. Some makers have been booking at a record rate, while others have noted some falling off. Cases are to be noted in shapes, where buyers have been unable to get satisfactory deliveries on contracts with other large interests and have been placing prompt orders with other mills. A number of contracts expiring May 1 were specified actively the final few days. Steel bars are moving evenly. Bar iron is stronger. Billets are in good demand.

Considerable miscellaneous business is being taken at 1.40c, Philadelphia, or 1.25c, Pittsburgh, in shapes, but on desirable lots, 1.20c can still be done. Plates, bars and billets are well held. We quote:

Plain structural shapes, 1.35c to 1.40c; tank plates, 1.35c to 1.40c; steel bars, 1.25c; common bar iron, 1.27c to 1.30c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage 1.55c to 1.60c; 4 x 4-inch open-hearth rolling billets, $22.40 to $23.40; forging billets, $26.40 to $27.40. Extras shown under Pittsburgh report.

Old Material.—A good demand for various grades of scrap prevails among eastern buyers, though there is no sharp covering. Occasionally some of these consumers are closing in liberal quantities. One leading steel maker has recently closed for probably 15,000 to 20,000 tons of steel material, including 5,000 tons of turnings at $11, delivered. The heavy melting steel was taken at about $13.50, delivered. There has been an improved buying of railroad wrought in small quantities. Several grades have shown further advances this week. Interest is now centered in the monthly railroad lists before bidders. This material in view of the state of the market is expected to bring considerably higher prices. We quote gross tons, delivered in buyers' yards in eastern Pennsylvania and western New Jersey, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (rerolling)	14.25 to 14.75
No. 1 heavy melting steel	13.50 to 13.75
Old car wheels	13.00 to 13.50
Old iron axles	23.00 to 24.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	16.00 to 16.50
Wrought pipe	12.50 to 13.00
Cast borings	10.00 to 10.50
Machine shop turnings	10.50 to 11.00
Heavy cast	13.50 to 14.00
Malleable	11.75 to 12.25
Stove plate	10.50 to 11.00
No. 1 forge	11.75 to 12.25

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

TALKED STANDARDS

Association of Steel Manufacturers Held Annual Meeting.

The annual meeting of the Association of American Steel Manufacturers held recently at the Marlborough-Blenheim, Atlantic City, was attended by representatives of most of the 32 steel companies composing the membership, and the time was occupied chiefly in preliminary work on proposed additions to the useful manufacturers' standard specifications, and to a review of specifications already in force, with special reference to amendments that had been suggested. As none of the matters discussed have as yet reached their final form, no announcement will be made of them at this time.

The officers, all of whom were reelected, are as follows: President, A. A. Stevenson, vice president of the Standard Steel Works Co., Philadelphia; vice president, P. E. Carhart, inspecting engineer Illinois Steel Co., Chicago; secretary and treasurer, Jesse J. Shuman, inspecting engineer, Jones & Laughlin Steel Co., Pittsburgh.

The Berwick, Pa., plant of the American Car & Foundry Co. has received an order for a number of steel box cars, the equipment having been ordered by a railroad in Brazil. This is said to be the first order of the kind ever received.

METAL MARKETS

Tin's Upward Shoot—Copper Stronger

New York

April 30.

Tin.—Accompanied by the heaviest trading for many weeks in the London market, standard tin advanced £9, Monday, and toward the close sold off £3 from the highest price of the day and closed at £212 for spot and £209 for three months. The market opened feverish today with total transactions very much lighter; and closed at a decline of £1 10s and £1, respectively, from last night's final prices. In the local market offering prices followed the foreign advance, but only a moderate amount of business resulted. All domestic buyers remained interested spectators with a few exceptions, who had pressing demands for the metal. These were met at prices ranging from 46.25c to 46.50c. Spot tin closed nominally at 46.25c, May at 46c today. The sellers' position is conceded to be stronger at present than at any time for the past two years of high prices. Estimates of the statistics that will be published tomorrow place the total of deliveries into consumption during April at between 8,500 and 9,000 tons; total shipments from the Straits and Australia at about 4,600 tons, and a decrease in total visible of approximately 4,000 tons. Domestic deliveries will be close to 5,500 tons.

Copper.—Resale lots by speculators and some consumers who stocked up well during February and March at lower levels dominated prices at the close of this month. Business has been done at ⅛c under the quotations of the prominent producing interests which maintain their offering quotations at 16c, cash New York, and 16.12½c, delivered 30 days, for electrolytic copper. Lake is 16c to 16.12½c, and casting is 15.75c, usual terms. The redistribution of stocks to points where the metal is required for consumption has strengthened the general copper situation. Foreign developments have been along the same lines, and it is the trade opinion that when the large buying is resumed little metal will be available under the asking prices of leading sellers. Exports of copper since April 1 are 20,971 tons.

Lead.—Consumers are apparently well supplied and both the independent sellers and the American Smelting & Refining Co. are offering the metal at 4.20c in New York.

Spelter.—Offers of 6.85c in New York for immediate shipments have been made and turned away by western interests during the past week. It is difficult to secure deliveries this side of May 15, except at fancy prices. A fair business has been done in late May, June and July at from 6.85c in New York, down to 6.65c.

Antimony.—Business continues quiet at unchanged prices. Cookson's is 8c, Hallett's is 7.75c, and Hungarian is 6.75c to 7c.

Chicago

April 29.

New Metals.—The metal market is moving along steadily in the west. The demand for copper is fairly active and prices show no weakness. Spelter is now quoted 6.75c, Chicago, and is apparently scarce. Lead is weaker.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 16⅛c; casting, 15⅞c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 6.75c; lead, desilverized, 4.20c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, 8.65c, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 45c. Cookson's antimony, 8½c; other grades, 7½c to 8c.

Old Metals.—The market is quiet and without change. The copper market is satisfactory but buying in general is on a hand-to-mouth basis.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 14½c; copper bottoms, 13¼c; heavy cut crucible copper, 14½c; heavy red brass, 12½c; heavy yellow brass, 10c; No. 1 red brass borings, 11c; No. 1 yellow brass borings, 9c; brass clippings, 9¼c; lead pipe, 3½c; tea lead, 4c; No. 1 aluminum, 12½c; No. 1 pewter, 28c; block tin pipe, 39c; tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $90 ton.

Crangie, Hagerty & Wright, of Toronto, have placed an order with the Collingwood Ship Building Co., Collingwood, Ont., for a 9,000-ton steamer to be 510 feet over all, 490 feet keel, 56 feet beam and 31 feet deep.

IN MARKET FOR RAILS

Australian Government Invites Tenders for 135,633 Tons May 29.

Toronto, Can., April 24.—D. H. Ross, Canadian trade commissioner for Australia, has advised the department of trade and commerce, Ottawa, that the Australian government is inviting tenders for 135,633 tons of steel rails and 9,634 tons of fish plates required for the government railway system. Tenders close on May 29.

Angus McPherson and Harry McDonald, of Fort William, Ont., have leased the former plant of the Lumby-Stenhouse machine shops and begun business under the firm name of the Fort William Machine Co.

The Pioneer Tractor Co., of Winona, Minn., manufacturer of tractors, has decided to establish a branch at Calgary, Alta., and has purchased a site of 40 acres. The plant will cost about $250,000 and employ 300 men at the outset.

The rate-payers of Niagara Falls, Ont., have voted to purchase a $3,000 site for the Pollard Machine Co., which has agreed to locate there.

Plan Canadian Branch

The Warren Axe & Tool Co., Warren, Pa., has voted to increase its capital stock to $200,000 to take care of its growing business in axes and logging tools. It contemplates the erection this year of a factory at St. Catharines, Ont., for the manufacture of these products. The Canadian company will be known as the Canadian Warren Axe & Tool Co., Ltd., and will have a paid up capital of $150,000. The officers of the American company are: President, E. E. Allen; general manager and treasurer, H. P. Stone; secretary, W. A. Kinnear; superintendent, D. W. Murphy.

Presages High Alloy Prices

Manganese ore is firm, and very high freights are being paid to bring material from abroad to this country, as much as 28s 6d having been given to charter a steamer from India to Europe. At this rate cheap ore will be a thing of the past, and smelters will have to reckon upon a largely increased cost of production. America has bought a few small lots of spot English ferro-manganese at prices working out at about $43 to $44, c. i. f. Atlantic ports.—*The Ironmonger*, London.

DEFICIT SHOWN

Steel Corporation Files Report For Preceding Quarter.

The quarterly report of the United States Steel Corporation covering the period ending March 31, shows a deficit of $6,292,134, thus reflecting further the extraordinarily low prices which prevailed last fall when much of the tonnage was booked. Total earnings for the period were $17,826,973, and net profits $12,108,415; which, after the deduction of interest on Steel Corporation bonds, left $6,366,566 available for dividends. This sum, however, fell short of the payment of the dividend charges by $6,292,134, which will be provided for by the undivided surplus on hand Dec. 31, 1911.

During the first quarter of 1911 the total earnings were $23,519,203 and the net profits $20,001,817. The quarterly surplus was $31,155.

A comparison of the net profits of the Steel Corporation available for dividends for the first quarter periods during the past several years, shows the following:

1906	$22,371,919
1907	27,031,008
1908	8,854,297
1909	11,873,107
1910	24,191,232
1911	20,101,817
1912	6,366,566

At the quarterly meeting of the directors at New York, April 30, following which the report was issued, the retiring officers of the steel Corporation for the ensuing year were re-elected.

The statement of the Steel Corporation covering the first quarter ending March 31, 1912, is as follows:

	Earnings.	Less: Interest.	Balance.
January	$5,967,063	$723,657	$5,243,406
February	6,149,759	722,439	5,427,320
March	7,877,618	721,371	7,156,247
Total earnings			$17,826,973
Deprec. & S. F.			5,718,558
Net earnings			$12,108,415
Interest on U. S. Steel Corp. bonds			5,741,849
Balance			$6,366,566
Divs.			12,658,700
Deficit			$6,292,134

Unfilled Orders on Hand.
March 31, 1912..... 5,304,841 tons.

Reunion at Chicago

The Chicago Foundrymen's club has definitely decided to hold its annual reunion May 25. Arrangements have been made to visit the Gary steel plant during the afternoon and the annual banquet will be held in the evening. In all probability the trip to Gary and return will be made by boat, luncheon being served en route. It is expected about 400 will attend. The committee in charge of the entertainment includes: C. B. Carter, of the American Brake Shoe & Foundry Co., chairman; E. F. Axner, J. T. Lee, G. A. Long and H. Cole Estep.

COPPER PRODUCTION

In 1911 Was the Largest in the History of the Industry.

The smelter production of primary copper in the United States in 1911 was 1,097,232,749 pounds, as compared with 1,080,159,509 pounds in 1910, an increase of about 1.5 per cent, says an advance statement of the production of copper in the United States, compiled by B. S. Butler, of the government geological survey. The production for 1911 was the largest in the history of the industry.

The total production of new refined copper in 1911 was 1,433,875,026. This was the largest output in the history of the industry, exceeding that of 1910 by 11,835,893 pounds. Returns from all smelting and refining companies show that there were 122,803,656 pounds of electrolytic, lake, casting and pig copper on hand Jan. 1, 1911, compared with 88,372,195 pounds on Jan. 1, 1912, making a decrease of 34,431,461 pounds during 1911. The apparent consumption of refined new copper in the United States in 1911 was about 681,700,000 pounds, compared with 732,400,000 pounds during 1910.

Strike Settled and Mill Resumes

The sheet plant of the Alan Wood Iron & Steel Co., at Conshohacken, Pa., resumed operations April 29, after a shut-down of about a week, caused by a strike of the outside laborers for an advance in wages. When the men struck, early in the preceding week, the plant was promptly shut down and a conference held with the strikers by the works management. This meeting quickly developed a satisfactory adjustment by which practically all the demands of the men were granted and their wages were advanced from $1.35 to $1.50 per day.

Orders Locomotives.—The Chicago, Indianapolis & Louisville railway has ordered 15 super-heater Mikado freight locomotives and three Pacific heater passenger locomotives from the American Locomotive Co. The same builder has also taken an order for five consolidation freight locomotives from the Chicago, Terre Haute & Southeastern railroad.

H. P. BROWN APPOINTED

To Take Testimony in Steel Corporation Dissolution Suit.

Henry P. Brown, of Philadelphia, has been appointed special examiner to take testimony in the suit instituted by the federal government, praying for the dissolution of the United States Steel Corporation. This order has been entered in the United States district court of New Jersey, where the suit was instituted. It is signed by Judges Gray, Buffington and McPherson, constituting the court of the district.

The examiner is authorized by the order to take testimony either within or without the state of New Jersey. In view of the fact that it will be more convenient to consult the books and documents of the defendant interest there, it is believed that most of the hearings will be held in New York City. The examiner will hear witnesses from both sides and submit the evidence to the court before which the case will be finally argued. Mr. Brown is a member of the Philadelphia bar.

Hearings before the examiner will be begun in New York, May 6. These sittings will be held at the Customs House in that city. It is expected that the evidence to be taken will be very voluminous and that the hearing will extend over a considerable period of time.

Change Offices

The location of the offices of Eaton-Rhodes & Co., Cincinnati, dealers in iron, steel, coke, and scrap iron, will be changed on May 6 from the eleventh floor of the First National Bank building, that city, to larger and better quarters on the fifth floor of the same building.

The offices of Walter-Wallingford & Co., Traction building, Cincinnati, dealers in pig iron and coke, are being enlarged and remodeled.

Closing Warehouse.—The Prentiss Tool & Supply Co., Singer building, New York, announces that its warehouse at 115 Liberty street, New York, will be closed on or about May 1, and the stock removed to the warehouse and demonstrating plant, at 447 Communipaw avenue, Jersey City, N. J.

The Toledo Machine & Tool Co., Toledo, O., has contracted for the erection of a three-story iron and brick building, 90 x 115 feet, which will be used in connection with its present business.

INDUSTRIAL RAILROADS

Affected by Decision of Interstate Commerce Commission.

An important decision, affecting the ownership of industrial railroads, was handed down April 29 by the Interstate Commerce Commission. All lines of this character, including those owned and operated by iron and steel companies, are affected by the decision, which is an announcement of policy on the part of the commission. There are nearly 2,000 cases involving the same point pending before the commission. The interpretation of the decision is thus given in the syllabus of the case entitled "The Tap-Line Case":

"The common ownership of an industry and a short line serving it, is not in itself sufficient to divest the railroad of its status as a common carrier. On the other hand, the fact that the rails, locomotives, and cars of an industry have been turned over to an incorporated railroad company, owned and operated by the industry or in its interest, does not divest those appliances of their character as a plant facility, if such, in fact, is the case. A line must be drawn at some point between what is transportation and what is industry and between a facility of transportation and a plant facility or tool of industry. Each case, however, must stand on its own facts. On the facts shown of record: *Held,* That the service performed for the proprietary lumber companies by certain tap lines described on the report is not a service of transportation by a common carrier."

Memorial for Col. Wick

Memorial services for Col. George D. Wick, who perished in the Titanic disaster, were held in Youngstown, O., his home, April 24. Mayor Hartenstein presided. Business in all lines was suspended from 11 until 11:05 o'clock. A representative of the Wick family will be sent to Halifax in the hope of identifying the body of Colonel Wick should it be recovered by the ship, Mackay-Bennett.

Trustees Appointed. — Vernon S. Phillips, of the Perry-Buxton-Doane Co., Philadelphia, and H. E. Rogers, of the Goldschmidt Detinning Co., of New York, have been appointed trustees by the United States District Court at New York to liquidate the assets of Emanuel Dreyfus & Co., Philadelphia, iron and steel merchants. An action for the appointment of a trustee in bankruptcy was instituted the past week by several of the creditors in the New York District Court, but upon hearing, the judge directed that this was not the proper proceeding to be followed and the appointment of the two trustees to liquidate the assets was then made.

DUES REDUCED

For Iron and Steel Institute—To Increase Membership.

Preparations are being made to greatly extend the membership of the American Iron and Steel Institute throughout the iron and steel and associated industries. In pursuance of this purpose, the board of directors of the institute at their regular monthly meeting at New York, Friday, April 26, voted to reduce the annual dues of the organization from $50.00 to $10.00 and the entrance fee from $50.00 to $5.00. Already there are indications that a large increase in the membership will result from this action, as many application blanks have been asked for by members. The directors also discussed and considered a tentative program for the general meeting of the institute to be held in New York, May 17 and 18.

Old Lebanon Furnace to be Operated

J. S. Kennedy, formerly manager of the blast furnace of the Musconetcong Iron Works at Stanhope, N. J., and associates have acquired control of the blast furnace of the Lebanon Valley Furnace Co. at Lebanon, Pa., and are preparing to put the plant in operation. The furnace, which has not been operated for several years, is 14 x 64-5/6 feet in dimensions and has an annual capacity of about 25,000 tons. It is the intention of the new controlling interest to operate the stack on malleable and foundry iron and J. J. Mohr & Son, of Philadelphia, will act as the sales agents. The transaction involves the control of a one-ninety-sixth interest in the Cornwall ore banks, which has been held by the Lebanon Valley Furnace Co., and the furnace will be operated on a mixture of Cornwall and Lake ores. The Lebanon Valley property has been long known in the trade as the Meily furnace.

Gives For Safety. — The United States Steel Corporation through Chairman E. H. Gary has presented the American Museum of Safety, 29 West Thirty-ninth street, New York City, with the sum of $5,000 to be used for obtaining a permanent collection of the best devices for saving life at sea, which will be made a public exhibit for study and inspection.

GENERAL ELECTRIC CO.

Makes Its Report For the Year Ended Dec. 31 Last.

In its report for the year ended Dec. 31 last the General Electric Co. shows net earnings of $10,562,806, a decrease of $292,886 from the previous year. The income account, with changes, follows:

		Increase.
Total receipts	$73,394,378	*$1,313,311
Net profits	10,562,806	*292,886
Dividends	5,806,344	591,976
Surplus	4,756,462	*884,862
Previous surplus	23,022,706	5,641,325
Total surplus	27,779,168	4,756,462

*Decrease.

Commenting on the company's business, President Coffin says:

"Substantial increases in the sales departments were made during the year to place these departments in a position to thoroughly exploit the steadily increasing variety of electrical appliances manufactured by your company, and to provide for the growth in number and complexity of orders received. This has resulted in increased selling expenses, which have been still further augmented as a result of the severe competition in nearly every branch of the business. The tonnage output of the factories was greater than in the previous year, but, due to reduction in selling prices, the sales billed were less."

Rate Hearing Postponed

Railroad rates for hauling blast furnace coke are affected by a ruling made by the Interstate Commerce Commission and issued April 27. While the ruling affects blast furnace coke as carried on the Louisville & Nashville railroad, yet it also affects many other lines engaged in the traffic. The formal order postpones until Nov. 1 the time of taking effect of an increase in coke transportation rates.

In December, last year, the Louisville & Nashville railroad gave notice of its intention to increase rates and filed new tariffs. The commission issued an order postponing, until May 1, the time when the new rates should become effective.

A hearing will not be given earlier than Nov. 1 and it will require two or three months to dispose of the case, consequently the present rates will remain in force until early in 1913.

The King Foundry Co., St. Joseph, Mo., has increased its capital stock from $15,000 to $20,000, and will extend its plant.

CUMMINS BILL

Iowa Senator Introduces Suggested Tariff Amendments.

Senator Cummins, of Iowa, this week introduced an amendment to the existing tariff schedules which proposes to place a number of articles on the free list and to reduce the duty on other articles. It is not expected that the amendments proposed by Senator Cummins will be adopted by the senate at the present session. In a statement issued by the senator analyzing his proposition the following is included:

"The metal schedule of the Payne-Aldrich tariff law is composed of 82 paragraphs. The proposed amendment (to the present operating tariff law) rewrites 54 of these paragraphs, making specific changes in the duties. As to 28 of the paragraphs, the reduction proposed is horizontal. In a general way the 54 paragraphs which are rewritten, comprise what is generally known as tonnage iron and steel, together with lead and zinc. They include the commodities which are usually handled in tonnage quantities. The 28 paragraphs in which reduction is horizontal cover the more highly organized and manufactured forms of metal, such as cutlery, watches, etc.

"In so far as has been possible, specific duties have been used instead of the ad valorem duties adopted in the schedule by the house of representatives; but in some instances the reductions are greater in the proposed amendment than in the house bill.

"With respect to the 28 paragraphs comprising the more highly organized forms of manufacture, the reduction is 20 per centum. The reason that these paragraphs have not been rewritten and the duties readjusted is that there has not been the same investigation with respect to the costs of these articles as has taken place with regard to the cruder forms of iron and steel; and then, the author is a protectionist; he has been careful not to go below the point which will afford ample protection."

Central Foundry Co. Report Made

During the period from April 22, 1911, to Dec. 31, 1911, the Central Foundry Co. proper did a gross business of $1,867,920 and showed net profits amounting to $124,889, or about 7 per cent of the gross business done. This profit was sufficient to provide for the overhead expenses of the Central Iron & Coal Co., not carried in the latter's coal and coke business and the small loss of the Central Radiator Co., and leave a surplus of $63,344. The deficit of the Central Iron & Coal Co. and Central Radiator Co. April 22, 1911, was $217,744, less profits of all companies, April 22 to Dec. 31, 1911, $63,344.

GERMAN SYNDICATE

Renewed for Five Years with Aid of Kaiser.

New York, May 1. (By wire.)—Private cable advices received today state that the German Stahlwerksverband or German Steel Syndicate had been renewed for a period of five years. This is regarded as a very important announcement, as it insures continuance of staple conditions in the German industry and averts complications which had been feared. The kaiser exerted his good offices to bring opposing factions to an agreement and succeeded.

HARRIMAN LINES

Place Car Order—Many Cars Still Pending.

New York, May 1. (By wire.)—The Harriman lines have placed car orders calling for 8,450 and are still negotiating for 3,000. In the distribution the Pullman Co. received 5,700 box, the American Car & Foundry Co. 1,000 refrigerator cars, the Standard Steel Car Co. 750 stock cars, the Bettendorf Axle Co. 700 flat and 300 gondolas. In addition the Bettendorf company received an order for 9,100 steel underframes for all cars ordered and some others which will require about 50,000 tons of steel. It is estimated by high steel authorities that about 40,000 cars are now in the market.

Instantly Killed

Hinsdell Parsons, vice president and general counsel of the General Electric Co., was instantly killed near Albany, April 28, when a tire of his automobile exploded, overturning the machine into a ditch. Mr. Parsons was a resident of Schenectady, N. Y., and was 48 years of age. He became general counsel of the General Electric Co. in 1894, and was made vice president in 1901.

NEW SHEET MILL

For Heavier Products To Be Installed By Alan Wood Co.

The Alan Wood Iron & Steel Co., Philadelphia, has decided to install in connection with its open-hearth steel works at Ivy Rock, Pa., finishing capacity for the manufacture of blue annealed sheets and light plates of a heavier gage than it has hitherto produced. There will be installed a three-high 30-inch mill equipped for automatic operation. This mill will have a capacity of rolling sheets or plates down to No. 12 gage in weight and up to widths of 72 inches and to lengths of 30 feet. It will be the first finishing mill to be installed at the Ivy Rock plant of the company, and the facilities added will represent a considerable extension of the Alan Wood company line of sheet products. Plans for the enlargement are now being prepared by Julian Kennedy, of Pittsburgh.

Will Remove Springfield Works to Worcester, Mass.

The Critchley Machine Screw Co., which recently completed a new plant in Armory street, Worcester, Mass., has acquired the business of the H. E. Chellis Co., Springfield, and will remove the machinery and other equipment of the Springfield plant to Worcester. The concern has bought the National Acme machines of the Hampden Machine Screw Co., Springfield, and five motor-driven machines of the same kind from the McCue Co., Buffalo. The screw machine department of the J. L. Parker Co., 62 Jackson street, was also absorbed by the Critchley Co. before the latter concern removed to its new plant.

The Bowler Foundry Co., Cleveland, has ordered a new 50-ton cupola from the Ohio Machine & Boiler Co., Cleveland. This increases the capacity of the foundry to 75 tons per day. A new 250-horsepower gas engine has also been ordered from the Bruce-Macbeth Engine Co., Cleveland. The plant will be electrically driven throughout. The Bowler company is also planning to purchase two electric cranes.

The Shenango Valley Electric Light Co. has been given a contract by the National Malleable Castings Co. for furnishing the electric current for the operation of a new electric steel furnace being installed by that company at Sharon, Pa.

Some Recent Developments in Permanent Molds

Details of an Intricate Iron Mold for Casting Small Projectiles and a Machine for Making Grate Bars

When the permanent mold for gray iron castings was first conceived, a number of year ago, it was claimed that its limitations would be determined by the shape of the section, and while it was admitted that the practice might prove successful, nevertheless, the fact that it lacked universal application, to an extent, minimized its importance. It was not believed that it would be possible to produce castings such as soil pipe fittings in permanent molds, owing to the large area that had to be cored out, and while it was generally agreed that it might be applicable to sash weights, brake shoes and other heavy sections, many foundrymen, trained in the casting of iron in sand, had to be shown when informed of the results which have made history in the foundry world in recent years. The equipment for producing pipe fittings in permanent molds was fully described in the columns of THE IRON TRADE REVIEW several years ago, and since that time numerous other machines have been built for casting intricate gray iron sections, which are in successful use today. The section or rather the form of the casting no longer seems to be the obstacle that retards the widespread application of the permanent mold. The ingenuity of the builders in designing the molds for various intricate sections, if taken as a basis for future development, might result in the prediction that there are few sections, either gray iron or steel, which cannot be successfully made in cast iron molds. To the untiring persistence of Edgar Allen Custer, of the Custer Sandless Casting Co., Philadelphia, the great development in permanent mold practice for gray iron is almost entirely due. Not many years ago, at the plant of the Tacony Iron Co., Tacony, Pa., Mr. Custer installed a continuous soil pipe casting machine, employing heavy permanent molds and sand cores. The next development led to the installation of a battery of machines for making soil pipe fittings of all sizes in which two cores were successfully used. Sash weights were next attacked and this problem proved easy of solution. Molds were then sucessfully made for plow points and agricultural castings of all kinds, brake shoes, etc. The design and construction of the permanent molds was by no means the only feature of this practice which required careful attention. The melting of the iron, the shaking-out of the castings and the temperature of the iron when poured, were a few of the many problems which had to be solved before success crowned the efforts of the investigators in this line of work. Mr. Custer has freely given to the foundry world the results of his experiences and the methods of melting, casting, etc., pursued in permanent mold practice have formed the basis for numerous articles which have appeared in THE IRON TRADE REVIEW from time to time during the past four years. An exceedingly ingenious machine which has been installed in the foundry of the League Island navy yard, Philadelphia, was designed to cast at one time, two 1-pound

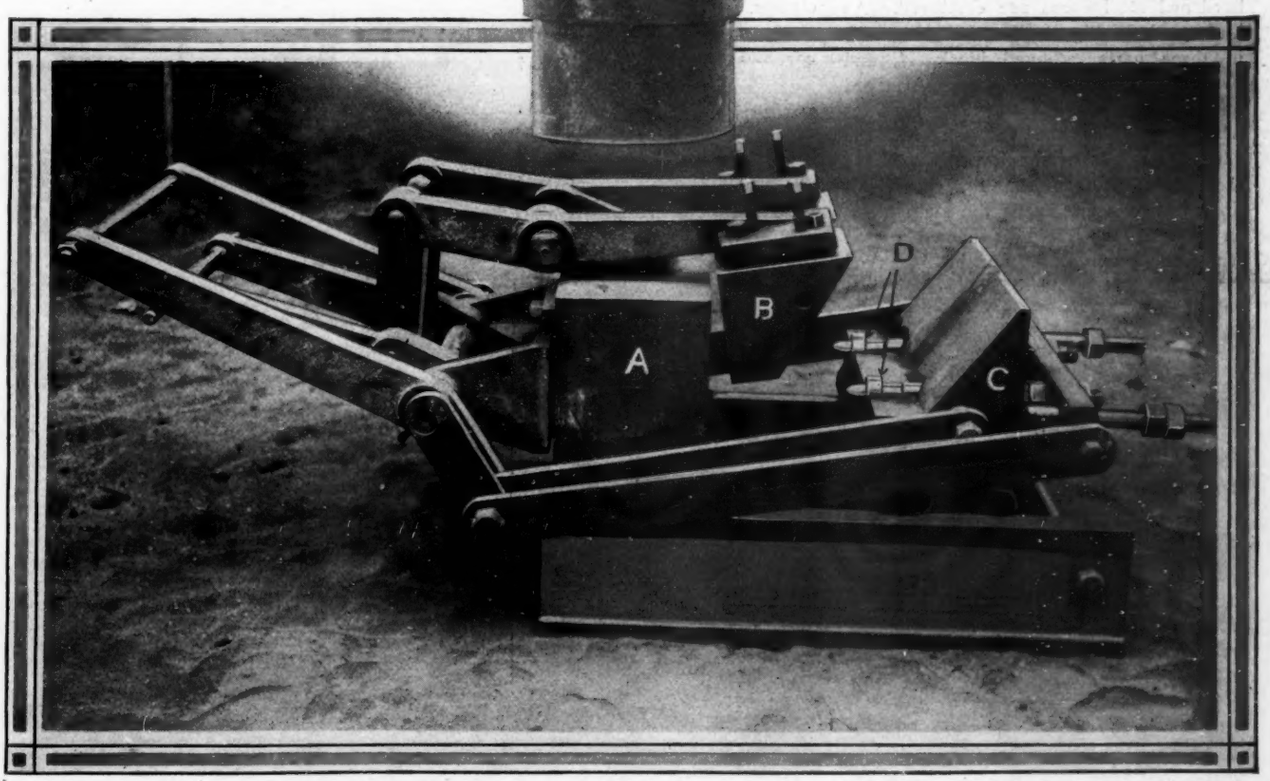


FIG. 1—PERMANENT MOLD FOR CASTING TWO PROJECTILES AT ONE TIME; ONE OF THE PROJECTILES AS CAST IS SHOWN AT THE TOP OF THIS VIEW

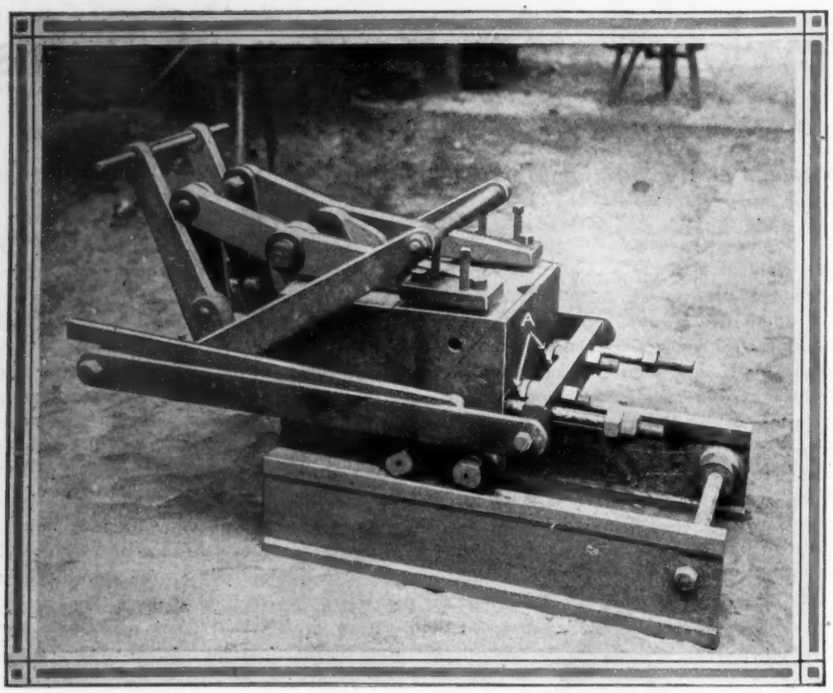


FIG. 2—THE PERMANENT MOLD FOR CASTING PROJECTILES IN CLOSED POSITION FOR RECEIVING THE METAL

projectiles for use in United States navy target practice service. This permanent mold, which is shown in Figs. 1, 2, 3 and 4, embodies several novel features. A copper ring or band is cast in place around the shell, a portion of the casting is hardened and, in addition, air-hardened steel cores are employed. As illustrated in Fig. 1, the mold is made in three parts, a fixed block, *A*, and two movable blocks, *B* and *C*. Attached to the fixed block are the lever brackets which serve as the fulcrum for the various motions of the levers which are arranged to perform four different functions with one motion of the main lever. In Fig. 2, the mold is shown closed ready to pour. Both movable parts of the permanent mold have been locked in position. The lower part of the mold, *C*, Fig. 1, has been locked by two straight clamps pinned to this mold section and notched over the shaft in the rear, while the upper part of the mold, *B*, Fig. 1, has been locked by the toggle levers, which are adjusted to form a straight line as indicated in Fig. 2.

Withdrawing the Cores

The first movement of the levers has as its function the drawing of the cores from the casting. This movement can readily be noted by comparing Figs. 2 and 3. It will be seen that at *A*, Fig. 2, the adjusting nuts are practically flush with the face of the pattern, while at *A*, Fig. 3, the levers have moved forward, the bars carrying the air-hardened steel cores, thereby withdrawing them from the castings. The next function of the levers is to release the clamps on the lower block, *C*, Fig. 1. This is accomplished by means of two small pins, one on either side of the main lever, which, as the lever moves around, engage the clamps and throw them up out of their notches. Fig. 3 shows the pins about to engage the clamps. As the lever continues its motion, the moving plate to which the cores are attached comes in contact with the lock nuts on the studs and carries back the lower block or part, *C*, Fig. 1, on its rollers. As it reaches a position where it is clear of the casting, the lever engages the toggle lever and breaking the straight line of the links, raises the upper movable piece, *B*, Fig. 1.

Sequence of Movements

The separate motions and the timing of the movements of these blocks have been designed to produce a casting soft on the portion to be machined and hardened on the point. The first motion draws the cores, leaving the interior of the projectile soft and machinable. The clamps being released next, the lower portion of the mold is moved clear of the casting, as illustrated in Fig. 1, while the upper portion holds the casting in the fixed position of the mold, *A*. Finally, the upper portion, *B*, Fig. 1, frees itself from the castings, leaving them held by their points in part, *A*, of the permanent mold. A view of the mold with the upper portion raised away from the castings is illustrated in Fig. 4. This final operation must, of necessity, occur before the castings have reached their chilling point, as otherwise the shells would not be machinable. The complete operation of opening the mold requires only about two seconds. After the mold is open, the castings are left for a few seconds with their points in the fixed portion, while they take the required degree of hardness and then are removed by means

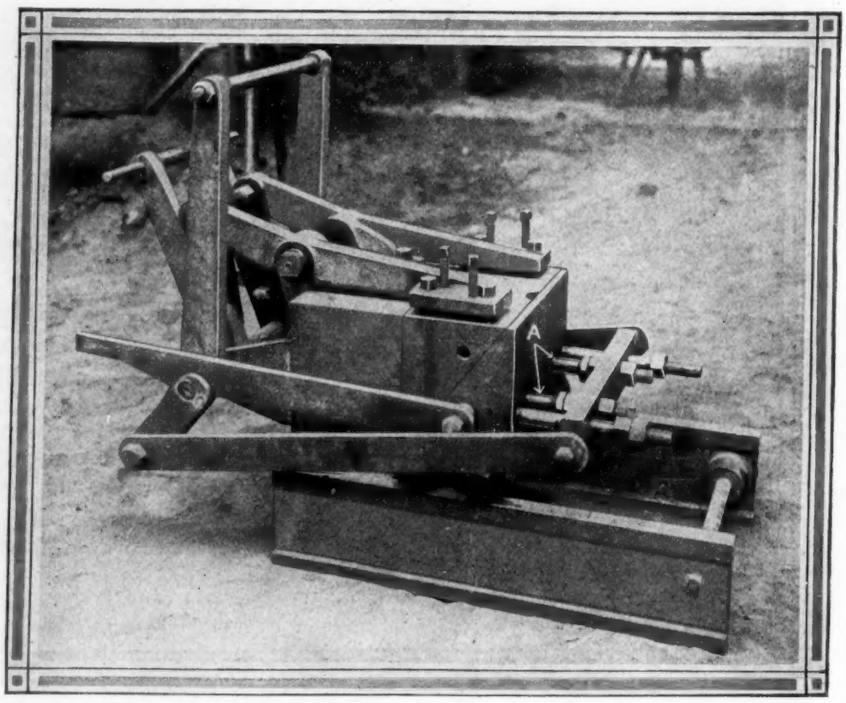


FIG. 3—PERMANENT MOLD FOR CASTING PROJECTILES, SHOWING THE FIRST OPERATION OF THE LEVERS WHICH WITHDRAW THE CORES FROM THE CASTINGS

of tongs. The copper rings, cut from seamless drawn tubing, are set in the mold before closing, as indicated at *D*, Figs. 1 and 4. It will be noted in Fig. 1 that the cores pass directly through these copper rings which become firmly seated on the cast projectile. The cores are made of air-hardened tool steel which has been found to be well-adapted for this work, as it does not swell, warp or cut under the conditions of temperature which obtain in this mold. The gates are cut in the movable portions of the permanent mold and are clearly indicated in Figs. 1 and 4. The standing gate is in the lower portion of the mold, *C*, Fig. 1, and the running gate is in the upper portion of the mold, *B*, Fig. 4, to give the necessary clearance.

Time of Operation

The entire operation of pouring, opening the mold and removing the castings requires about 10 seconds and the mold can be poured as rapidly as it can be cleaned out, the copper rings placed in position and the mold closed. There is no finish on this casting from the copper ring to the point, as this portion is cast to within a few thousandths of an inch of the required size. The copper ring is finished to fit the rifling of the gun barrel and the portion of the casting back of the ring is turned and grooved for the cartridge shell. The hole is threaded to receive a brass plug. At the top of Fig. 1 is shown one of these projectiles as taken from the mold.

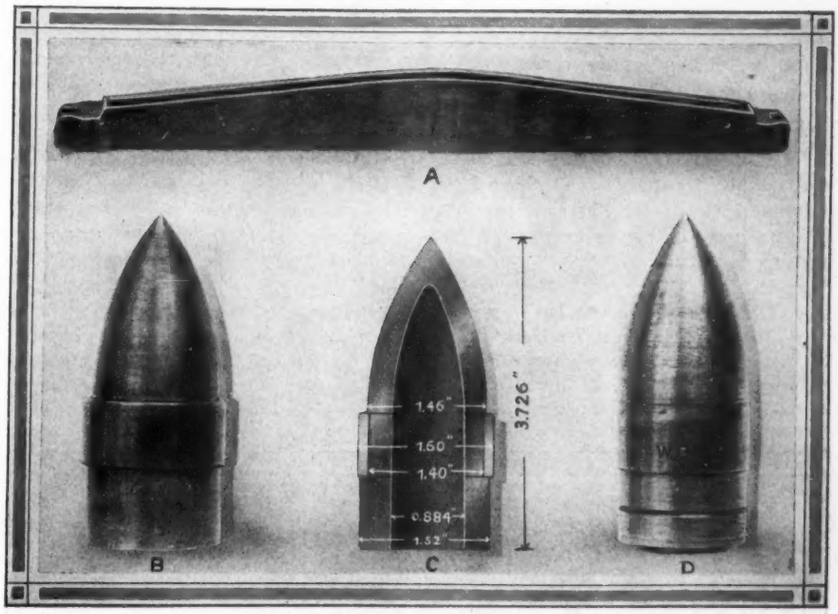


FIG. 5—AT *A* IS SHOWN A GRATE BAR MADE IN A PERMANENT MOLD; *B* AND *D* SHOW THE PERMANENT MOLD PROJECTILE AND *C* IS A SECTIONAL VIEW, GIVING DIMENSIONS

The copper ring is shown cast in position before it has been machined. The point of the projectile is hardened and the excellent finish is clearly indicated. In Fig. 5, *B* shows the projectile at the next stage of finishing, and *D* is a view of the finished projectile, showing the copper ring turned down and the machined groove; *C*, Fig. 5, gives the dimensions of the projectile, showing the location of the copper ring, the upper section of the projectile, which is hardened at the lower section which is turned and threaded on the inside.

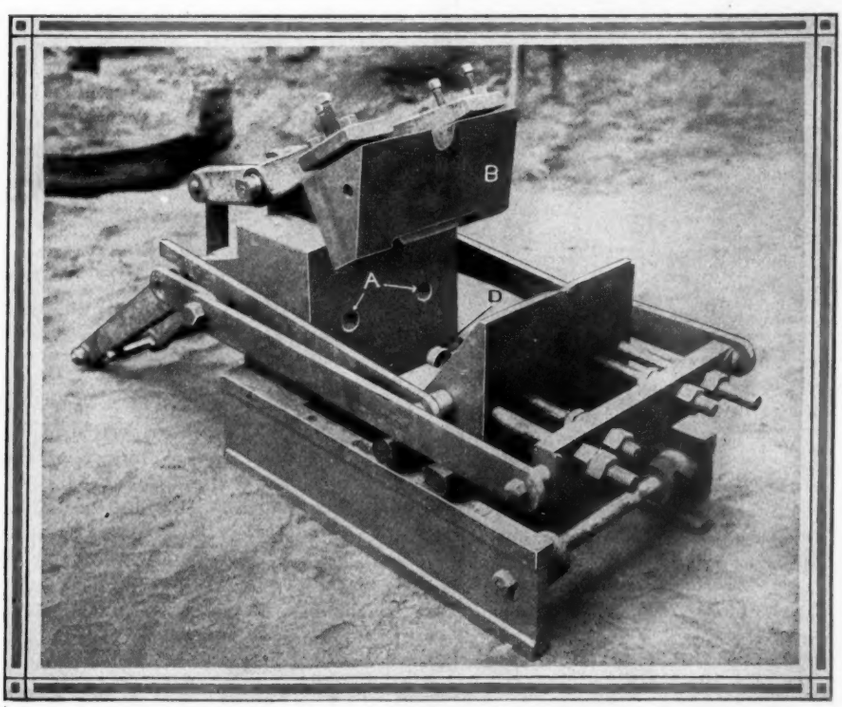


FIG. 4—PROJECTILE MOLD OPEN, SHOWING FACE OF STATIONARY SECTION OF MOLD; *A* INDICATES THE OPENINGS IN WHICH THE UPPER PORTION OF THE PROJECTILE IS CAST AND REMAINS FOR A BRIEF PERIOD TO BE HARDENED

At *A*, Fig. 5, is shown a United States standard grate bar, 35 inches long, which weighs 36 pounds. A permanent mold installed at the League Island navy yard has been designed for making this bar which, heretofore, has always been cast in sand. The mold, in its closed position for pouring, is illustrated in Fig. 6. It consists essentially of two blocks, one stationary and the other movable, each weighing about 1,750 pounds. In the faces of these blocks are machined the reverse of the exterior surface of the bar. The air spaces in the grate bar are made by an iron core for the center spaces and two small sand cores for the ends. The receptacles for the sand cores are prints cut into the faces of the mold and are shown respectively in Figs. 7 and 8. The iron core is hung in position by a double-acting lever arranged so as to give maximum power and slow travel at the start of the motion and swifter travel with less power at the finish of the motion.

Operation of the Mold

The action of this lever is clearly indicated in Figs. 6, 7 and 8. In Fig. 6, which shows the mold in its closed position, ready to receive the iron, the core is in its lowered or pouring position. The first motion of the lever has as its fulcrum the ends of the long links connecting it to the brackets and applies its power upon the short links connected to the core. The ratio of power here is about 50 to 1 and acts

through 90 degrees, which gives sufficient travel to clear the core from the casting. Fig. 7 shows the lever at the end of the 90-degree travel. At this point a plate attached across the levers engages the long links and throws the fulcrum back to the carrying brackets. This reduces the power to about 3 to 1 and increases the travel proportionally. Fig. 8 shows the core clear of the mold. The finished grate bar is ejected from the mold by three plungers, shown at *A*, Fig. 8. These plungers are attached to a bar carried on two studs in the back of the mold. The position of these plungers is set by two rods, one on each side of the mold, an end of each being attached to the bar and the other ends being passed through eyes in the ends of the movable half of the mold. These rods are each provided with an adjustable collar and a lock nut. The collar is so placed that when the mold is closed, the plungers occupy their proper place just flush with the surface of the casting. The lock nut is so adjusted that when the mold is opened wide, the eye engages it and throwing the plungers to their out position, ejects the casting. The various positions of the plungers are shown in Figs. 6 and 7.

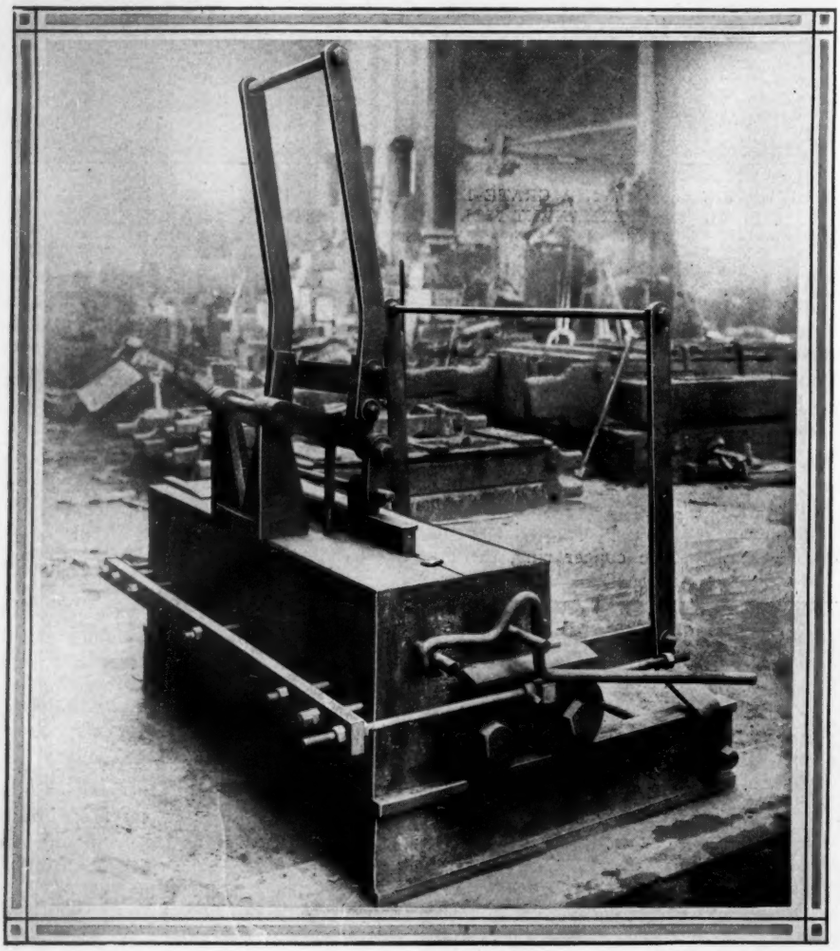


FIG. 6—PERMANENT MOLD FOR CASTING GRATE BARS IN CLOSED POSITION TO RECEIVE THE METAL

As indicated in Fig. 6, the mold is held shut by two spring clamps, which hold it closed while pouring, but allow a slight flexibility to accommodate the swelling of the iron as it sets. The grate bar is poured by two gates at the ends, which are clearly shown in Figs. 7 and 8. The elapsed time for one casting is about 12 seconds. This mold can be poured once every 4 minutes, if it is going to be operated for any length of time, but it will stand operating at a more rapid speed if it is to be used for only a short period during each heat.

At the foundrymen's convention in Pittsburgh, last year, the Custer Sandless Casting Co. exhibited permanent molds for casting mine car wheels and at the present time two permanent molds are being tried out, which have been arranged for casting standard, 750-pound wheels. The problem of obtaining an adequate chill in the tread has been solved, while the other parts of the wheel can be made as soft or as hard as desired. Another interesting mold, recently completed, is used for casting flywheels for sewing machines. The wheels in every particular are more perfect that those cast in sand and, in addition, the cost of manufacture has been very materially reduced.

Paxson Co.'s Extensions

The plant of the J. W. Paxson Co., Philadelphia, manufacturer of foundry facing, supplies and equipment, has been greatly extended by the erection of a new two-story, saw-tooth roof building, which is 90 x 120 feet. The additional manufacturing space thus provided is utilized by the departments engaged in the production of sieves, wire brushes, bristle brushes, bellows and wire cloth. The demand for these products has increased so rapidly in recent years that an increase in the output became essential. A large amount of new machinery also has been installed, which was especially designed and built for the particular requirements of these various departments.

The unusual facilities of the J. W. Paxson Co., not only as manufacturers, but as constructing and equipment engineers, is indicated by the fact that the new building was designed and built entirely by the company's employes. The site was laid out by the company's surveyors and all of the structural steel, concrete and carpenter work was done by gangs of workmen from various departments of the J. W. Paxson Co. An electric lighting and power plant also has been added and all of the machinery throughout the plant is now driven by individual motors.

A well-equipped chemical laboratory also has been added and greatly increases the company's facilities for making analyses for all of its raw materials, thereby insuring an absolutely pure and unadulterated product for the consumer. Careful analyses are made of all Paxson standard facings and, in addition, this department permits of the manufacture of any special facing desired by foundrymen. All of the molding sands shipped by the company are carefully analyzed and every effort is made to furnish the foundrymen with the best possible available product. The Paxson company has greatly added to its acreage of Albany molding sands, a number of large farms having been purchased during the past few years.

The stock department of a foundry supply house, owing to the varied line of product which is handled, requires careful attention to insure a constant supply of all materials to meet the demands for prompt ship-

ments. The Paxson company has installed an efficient stockkeeping system in which more than 1,500 items are listed The stockkeeper makes a daily report of the goods on hand and in this way the depletion of stocks of any materials is entirely obviated.

New Charcoal Iron Process

A new process for making charcoal iron, devised by J. Jones Hudson, Philadelphia, which is now being operated by the Vulcan Charcoal Iron & Steel Co., Crum Lynne, Pa., consists in melting the charge between strata or layers of charcoal in a specially designed furnace of the open-hearth type. The furnace is preheated by oil, gas, hydrocarbon vapor, or other suitable fuel, and a thick strata of charcoal is then introduced on which the charge is placed and is melted by the aid of cold air blast. After the charge is melted it boils and filters through the bed of charcoal, which consumes the impurities, thus eliminating them from the molten mass. Charcoal may be added at any time during the heat, and it is advisable to do so near the termination of the heat to dispel any injurious gases, and to insure the complete purification of the metal.

Different types of furnaces may be employed for the process, a 15-ton furnace being used at present. The furnace designed by the inventor of the process, has a basic lining and is fired at either end by oil burners. The front and back walls of the furnace are fitted with 6 tuyeres each, adjustably mounted, through which a blast of cold air, under pressure is conducted into and onto the charge as it melts. The furnace is preheated before the charge is introduced. The character of the charge is regulated by the quality of the product to be produced, but in all cases both charcoal and flux are used to increase the heat and continue the refining. Sulphur, phosphorus, silicon and other impurities can be reduced to a minimum, it is claimed, the mass being decarbonized until the analysis of the molten metal, shows the quality of iron required.

When the desired refinement has been attained, the metal is tapped into a bottom-pour ladle and is cast into ingots varying in size according to the kind of iron to be rolled, and after it has received a surface chill, it is given a wash in a suitable furnace or oven, and may then be passed directly to the mill, where it is rolled into plates, skelp, billets, or sheet and tin plate bars.

The charge usually consists of pig iron, wrought iron or steel scrap, varied to suit conditions and the material to be produced. Chemical analyses of eight heats follow:

Carbon, per cent.	Manganese, per cent.	Silicon, per cent.	Sulphur, per cent.	Phosphorus, per cent.
0.04	0.05	0.016	0.024	0.022
0.035	0.08	0.026	0.035	0.028
0.03	0.07	0.023	0.034	0.034
0.03	0.06	0.019	0.032	0.014
0.025	0.06	0.053	0.032	0.016
0.03	0.05	0.016	0.039	0.028
0.04	0.07	0.021	0.024	0.024
0.04	0.11	0.017	0.030	0.022

Physical tests of one of these heats gave the following results:

Elastic limit, pounds per square inch.	Tensile strength, pounds per square inch.	Elongation in 8 inches, per cent.	Reduction of area, per cent.
27,700	43,200	27.25	69.6
29,600	45,000	25.5	75

This new product is sold by Shimer & Co., 672 Bullitt building, Philadelphia.

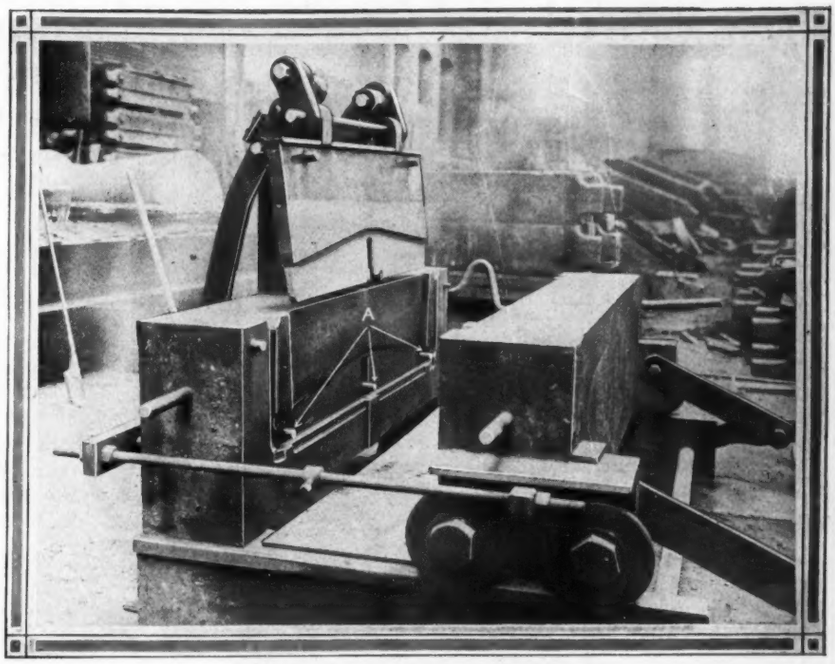


FIG. 8—STATIONARY PART OF PERMANENT MOLD WHICH ALSO SHOWS THE CORE RAISED OUT OF POSITION

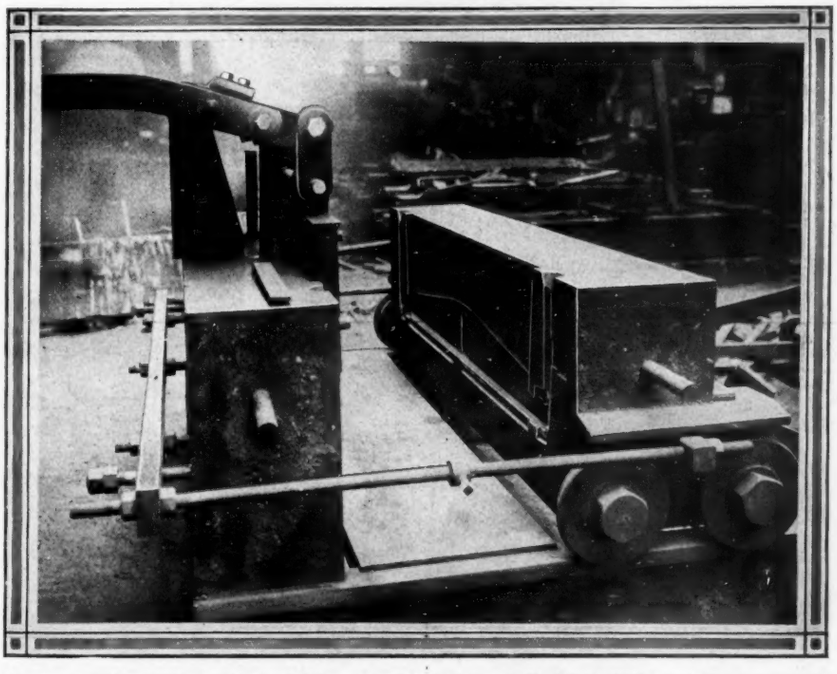


FIG. 7—PERMANENT MOLD FOR GRATE BARS, SHOWING THE FACE OF THE MOVABLE HALF

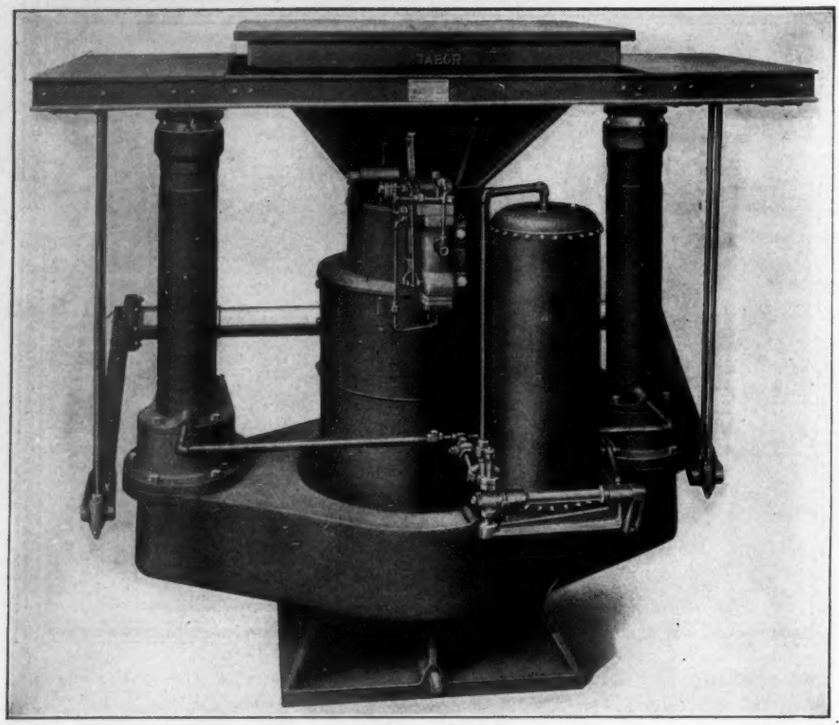


FIG. 1—SHOCKLESS JARRING MACHINE, EQUIPPED WITH TWO PATTERN-DRAWING CYLINDERS

Shockless Jar-Rammer Equipped With Pattern-Drawing Cylinders

The Tabor shockless jar-ramming molding machine equipped with two pattern-drawing cylinders is illustrated in Fig. 1. This machine is of the standard type equipped with a 10-inch jarring cylinder and is provided with a table, 42 x 54 inches. To the machine has been added a base which carries two pattern-drawing cylinders, each 6 inches in diameter and having a 36-inch stroke. The pattern-drawing plungers are coupled together by means of a squaring shaft mounted in bearings on the base and attached to the pattern-drawing frame carried by the plungers, thus insuring security of movement. The pattern-drawing plungers are operated by compressed air on oil which is contained in the oil tank shown at the front of the machine.

The speed of the stroke can be varied at will by the operator and the pattern-drawing frame may be stopped at any point desired during either its upward or downward movement. The machine can be used either with stripping plates or it can be arranged for rolling over the mold. When using stripping plates a lug on the stripping plate engages with the pattern-drawing frame in its upward movement, thereby lifting the stripping plate and flask leaving the pattern on the jarring machine table. When used as a roll-over I-beams are thrown across the pattern-drawing frame to engage with the trunnions on the flask and the flask is rolled on its trunnions when the plungers have reached the top of their stroke. After the flask has been rolled over, it is returned to the jarring table and bedded, then unclamped and the pattern drawn. The I-beams are placed on the pattern-drawing frame in a position to engage with lugs on the pattern board. The machine shown in Fig. 1 has capacity for handling molds up to 3,000 pounds in weight with 80 pounds air pressure at the machine, due allowance being made for speed of operation.

In Fig. 2 is shown a 6-inch plain jarring machine arranged similar to the shockless machine shown in Fig. 1. These molding machines are built by the Tabor Mfg. Co., Philadelphia.

Acid-Resisting Bronze Chain

The Morgan Engineering Co., Alliance, O., is manufacturing acid-resisting bronze chain, particularly adapted for handling material in pickling vats. The chains are cast in any length and for any capacity with special detachable clevises for either end so that the chains are ready for use without welding-in rings or long links. This bronze chain is guaranteed for a year's service in sulphuric and muriatic acid solutions.

The plant of the Portsmouth Machine & Castings Co., Portsmouth, O., which includes a well-equipped foundry and machine shop, will be sold on May 15, by Ed. J. Daehler, of Portsmouth. The foundry contains two cupolas, respectively 52 and 24 inches inside.

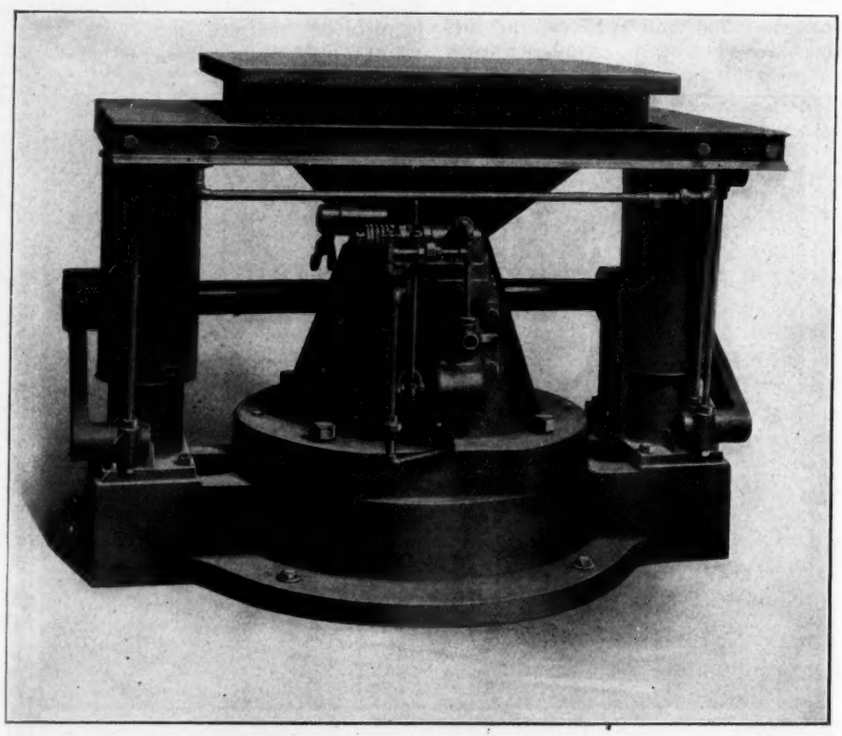


FIG. 2—PLAIN JARRING MACHINE EQUIPPED WITH TWO PATTERN-DRAWING CYLINDERS

Electric Reversing Blooming Mill Equipment[1]

Details of the Installation in the Algoma Steel Co.'s Plant With a Description of the Equipment

By Bradley T McCormick

The Algoma Steel Co., of Sault Ste. Marie, Ont., Can., has recently put into operation an electric reversing mill equipment operating the blooming mill. The mill is required to roll 75 tons per hour from ingots 20 x 20 inches into billets 8 x 8 inches in 15 passes. The electrical equipment, Fig. 1, is in a separate building from the mill, with an opening in the wall to permit connection between the mill motors and the rolls, while in the mill room, in a position convenient to the operator, are placed the operating controller and an instrument column carrying meters showing the current, voltage and speed of machines.

Motor Drive for the Rolls

The rolls are driven by two 600-volt direct current motors mounted on the same shaft. Each of these motors has a normal rating of 2,000 horsepower at 75 revolutions per minute and their armatures are connected in series across 1,200 volts. The current for the motors is supplied by a flywheel motor generator set consisting of two 1,700-kilowatt, 600-volt, direct current generators, with their armatures also connected in series, driven by a 25-cycle, three-phase induction motor of 1,800 horsepower capacity, at 375 revolutions per minute synchronous speed. A 150,000-pound flywheel serves to equalize the load, so that the power drawn from a 25-cycle line is kept practically constant at a value corresponding to the average power required by the rolling mill motors. The flywheel motor generator set is shown in Fig. 3.

As the power demand at the rolls rises and falls, a slip regulator automatically inserts or cuts-out resistance in the rotor circuit of the induction motor, thus providing sufficient speed variation of the motor generator set to enable the flywheel to alternately deliver and absorb energy in such a way as to make the load on the 25-cycle power line practically uniform. When the power demand of the roll motors exceeds the average, the resistance in the rotor of the induction motor is increased. This decreases the speed of the motor generator set, preventing a rush of current from the alternating current line, and at the same time allowing the flywheel to give up part of its stored energy to carry the mill motors over the peak load. When the power demand is light, the resistance is cut-out of the rotor circuit, allowing the induction motor to speed up the set and store energy in the flywheel.

From the plan, Fig. 1, it will be noted that under both the motor generator set and the mill motors, pits are provided in order to give easy access to the under side of the machines where the leads are connected to the terminal boards. These pits also provide a place for locating series shunts, resistances, etc., which would be very unsightly if placed above ground. The opening under the motor generator set is connected to the one beneath the motor by a passageway, and is reached by a stairway leading from the main floor.

The speed control and the reversal of the mill motors are effected by varying the voltage impressed upon their armatures through rheostatic control of the fields of the generators.

The excitation for both the mill motors and the generators is supplied by a 40-kilowatt, 250-volt induction motor, generator set. Fig. 6 shows the complete connection diagram for

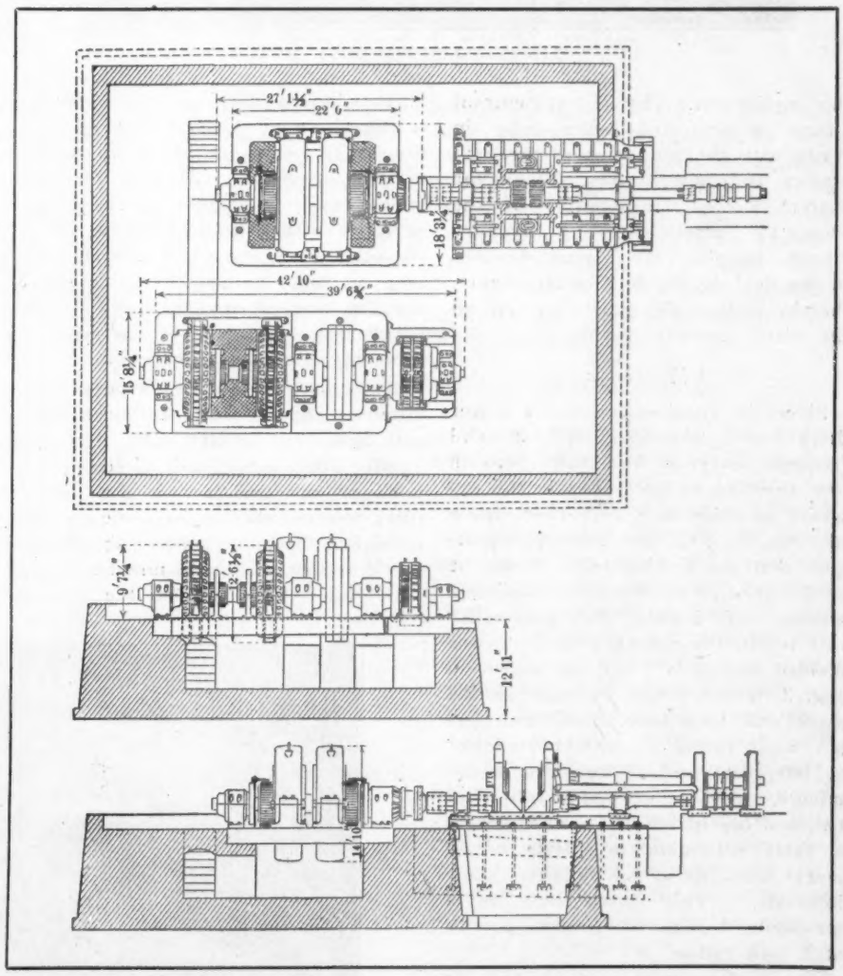


FIG. 1—PLAN OF MOTOR-DRIVEN ROLLING MILL EQUIPMENT

[1]Presented at the meeting of the American Institute of Electrical Engineers, held at Pittsburgh, April 25-27.

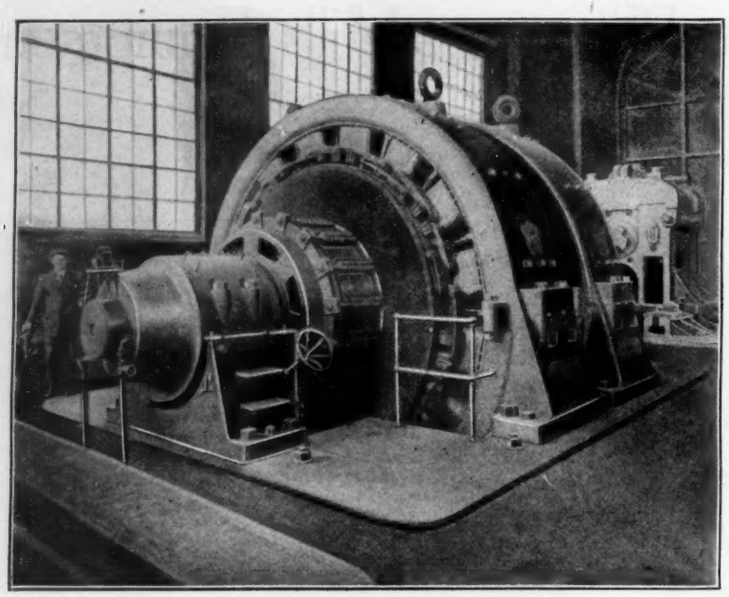


FIG. 2—2,000-HORSEPOWER MILL MOTOR

the equipment. The direct current circuit is protected by a relay in series with the armatures of the generators and mill motors. When the current exceeds the setting of the relay, the latter opens an auxiliary circuit, tripping the circuit breaker in the field of the 40-kilowatt exciter, thereby killing the excitation on all the direct current machines.

Mill Motors

Since the requirements for a motor drive for a reversing mill demand frequent reversals from full speed in one direction to full speed in the opposite direction in a very short space of time, it is of the utmost importance that the moving parts should be so designed as to obtain the minimum amount of inertia. To accomplish this result, the rolling mill drive was divided into two units, as shown in Fig. 2, mounted side by side on the same shaft and base. Each unit has a normal rating of 2,000 horsepower at 600 volts and 75 revolutions per minute, with a maximum rating of two and one-half times normal, giving a total maximum of 10,000 horsepower available at the rolls for short intervals. This corresponds to a maximum torque of 700,000 pounds at 1 foot radius.

The motors have 16 poles and are of the interpole type. They are also provided with compensating windings in the pole faces of the main poles, in order to reduce the distorting effect of the armature reaction upon the field which would otherwise become quite marked on the peak loads. The yokes are of cast iron, while the main poles and interpoles are of laminated steel punchings. The fields are wound of strip copper on edge in two layers with a duct between to afford an air passage for ventilation. The fields are each separately excited from the 250-volt exciter mains, while a regulating resistance in series with each field circuit gives an adjustment by which the motors may be made to equally divide their load, in case of any slight difference which may exist between the saturation curves of the two machines.

The motor armatures are connected in series and are designed for a normal pressure of 600 volts, but by varying the value and direction of voltage impressed across the armatures, the motors can be made to run in either direction at any speed up to 75 revolutions per minute.

In order to withstand the severe mechanical stresses set up by the rapid reversals of rotation and the shocks transmitted from the rolls, it was necessary to make the spider and commutator of the most rigid construction. The bearings are protected from end thrust by a thrust collar mounted on the bearing pedestal next to the rolls, Fig. 5. One side of the collar is of babbitt and the other of steel. Grease is used for lubricating and is fed by compression grease cups.

Direct Current Generators

The generators each have a normal rating of 1,700 kilowatts at 600 volts with a no-load speed of 375 revolutions per minute. The armatures are connected in series, giving 1,200 volts across the two machines. They are capable of carrying an overload of two and one-half times normal, corresponding to the overload of the mill motors. The generators are also of the compensated interpole type, but the magnetic circuit is entirely of a laminated steel, in order that the field may respond quickly to variations in excitation. Fig. 4 shows a portion of the generator during the process of construction.

The commutators are of the open neck type and are constructed in such a way that the air passes through the spiders of the machines, coming out through the commutator necks, and blows across the face of the commutators. No other source of ventilation is necessary to cool the commutators. As any vibration of the brush rigging is very objectionable on commutators of such high peripheral speeds, the brush mechan-

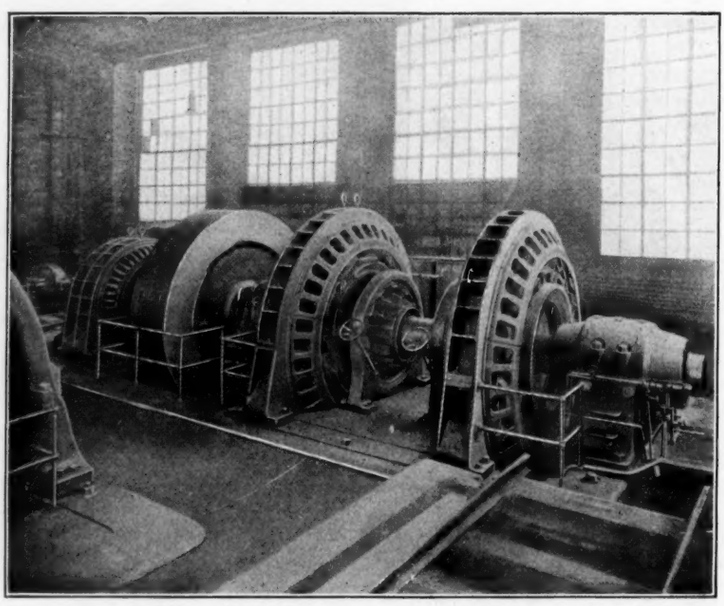


FIG. 3—FLYWHEEL MOTOR GENERATOR SET

ism is supported on a separate yoke mounted on the base plate.

The fields of the two generators are connected in series and excited across the 250-volt exciter mains, and controlled by a rheostat of such construction that the excitation can be reversed and varied by small steps over any range between zero and the maximum. This rheostat is mounted in the mill room and is under the control of the man operating the rolls.

Induction Motor and Flywheel

The induction motor has a rating of 1,800 horsepower, 2,200 volts, three-phase, 25 cycles, at 375 revolutions per minute synchronous speed. It is of the wound secondary type, in which the current from secondary, or rotor, is carried out through slip rings to the slip regulator. The flywheel is 12 feet in diameter, and is made of cast steel in three pieces, carefully machined on the rim and held together by fitted bolts passing through reamed holes.

It can readily be seen that the requirements of the bearings for the motor generator set are somewhat more severe than are usually met with in electrical machines of the ordinary type. The heavy weight to be sustained by the bearings on either side of the flywheel requires considerable bearing surface, and necessitates a large bearing diameter with correspondingly high velocity of rubbing, in order that the bearings shall not be unreasonably long. The combination of high bearing pressure and peripheral speed requires the most careful design to secure perfect lubrication. All of the bearings, both on the motor generator set and on the mill motors, are self-aligning, and

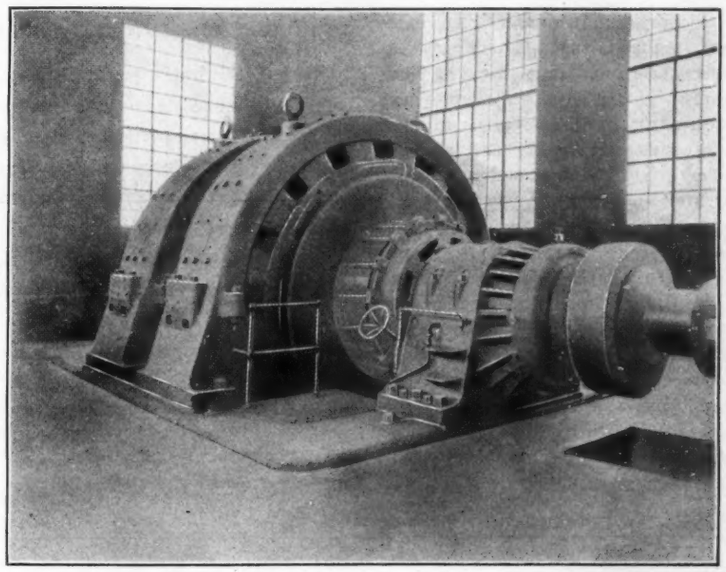


FIG. 5—2,000-HORSEPOWER MILL MOTORS, SHOWING THRUST BEARINGS

are provided with water-cooling and three distinct methods of lubrication, ring-oiling, oil-flooding and pressure lubrication. Under ordinary running conditions the pressure lubrication can be dispensed with, but it is very useful in starting. When the motor generator set comes to rest the oil film is squeezed out of the bearings, and unless this film can be established again before starting, a torque of about 60,000 pounds at 1 foot radius would be required to move the set from rest. But starting the oil pump soon establishes a film again so that the set will begin to revolve on the first step of resistance and come smoothly to full speed without any abnormal demand on the power station.

A small motor-driven oil pump furnishes the oil for both the flooded lubrication and pressure lubrication systems. The overflow from the bearings passes through a cooler and filter and then is pumped up into a storage tank from which it flows by gravity into the bearings. Valves are provided so that the oil can be by-passed around the cooler, filter and storage tank, and be pumped direct into the bearings under pressure, when starting.

Starting Apparatus

The rotating parts of the motor generator set revolving at 375 revolutions per minute have a kinetic energy of 85,000,000 foot-pounds. During the period that the set is being brought to full speed, the resistance in the rotor circuit of the induction motor is required to absorb this amount of energy. In order to dispense with a bulky cast iron grid resistance, a special water-cooled resistance was used. This resistance consists of a boiler iron tank with a water inlet valve at the top connected to the water mains, and a quick-opening gate valve at the bottom for an outlet. The resistance element is immersed in water and consists of a hollow iron tube of helical form, with the taps for the various starting positions, leading out through the top of the case. During the starting period the energy absorbed by the resistance is transferred to the water, after which the hot water can be emptied at the bottom and the tank refilled ready for starting once more. The steps of resistance are cut out by six short-circuiting switches, of the manually-operated, multiple lever type, mounted on the switchboard.

For the purpose of varying the slip

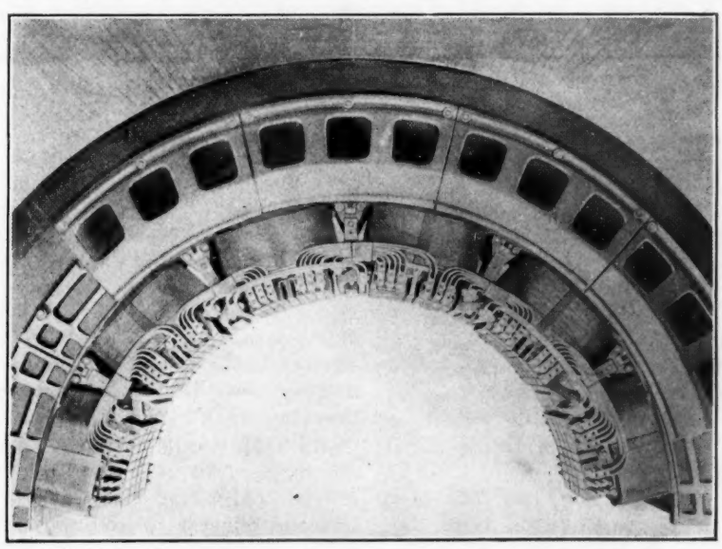


FIG. 4—1,700-KILOWATT GENERATOR UNDER CONSTRUCTION

of the motor generator set, cast iron grid resistance is used, made up of three steps automatically switched in and out of circuit by slip regulators. Each element of the slip regulator consists of a series relay and a contactor switch. The contactor switch is operated by direct current solenoids on the 250-volt exciter main and is actuated by the opening and closing of the series relay. When the current in the rotor exceeds a certain fixed amount, the series relay breaks the current in the solenoid of the contactor switch, allowing it to open and insert resistance in the rotor circuit of the induction motor, thereby reducing the current and increasing the slip. These switches are interlocked in such a way that they will operate one after another in the proper order.

The equipment has been in operation, rolling steel, since Dec. 10, 1911, and the results obtained indicate that the machines are well within the requirements and that the mill motors are capable of being reversed with sufficient rapidity to easily meet any requirements in rolling. In a rough test made in order to determine the length of time required to reverse the motors, 22 reversals were made in one minute at 75 revolutions per minute, with the voltage on the 250-volt exciter mains reduced to 200 volts.

Production of Lead in 1911

The United States geological survey has just issued its annual advance statement of lead production in 1911. This statement, prepared by C. E. Siebenthal, gives the final figures of output as made up directly from reports from all lead smelters in operation during the year. Preliminary estimates of the production in 1911 of lead, zinc, copper and some other metals were published by the survey, Jan. 2, 1912. These preliminary figures for lead are shown by comparison with the final figures to have been one-ninth of 1 per cent, or 544 tons, in excess of the actual production.

Missouri held first place in the production of lead, with an output of 182,207 short tons, and also made the greatest increase for the year, the gain over 1910 being 20,548 tons. Idaho, ranking second in production, with 117,159 tons, made also the second greatest gain, 17,235 tons. Arizona had an output of 3,450 tons, as compared with 858 tons in 1910. Utah produced 55,198 tons, a falling off of about 2,000 tons. Colorado, with an output of 30,621 tons, lost over 5,000 tons as compared with 1910. The production of lead from African ore fell off, being 509 tons as against 3,500 in 1910. The lead of Mexican origin likewise suffered a big reduction, chiefly due to political conditions in that country. The total production of lead of foreign origin was 94,134 tons, as compared to 108,553 tons in 1910.

The total production of refined lead in the United States from both domestic and foreign ores was 486,975 tons, as compared with 470,380 tons in 1910, a gain of 16,595 tons, or 3.5 per cent. The total production, including antimonial lead, was, for the first time, more than half a million tons, the exact figures being 501,053 tons. Of the refined lead produced, 295,357 tons was desilverized lead, and 155,947 tons was soft lead, in addition to which there was 35,671 tons of desilverized soft lead. The gain in soft lead production over 1910 was 22,374 tons, which compared with the total gain for the year, 16,595 tons, shows that the output of desilverized lead fell off 5,779 tons. The antimonial lead production for the year was 14,078 tons, practically the same as in 1910.

One table in the statement shows the recovery of secondary lead from drosses, old metal, etc., both as pig lead and rejuvenated lead alloys. Other tables give the exports of lead

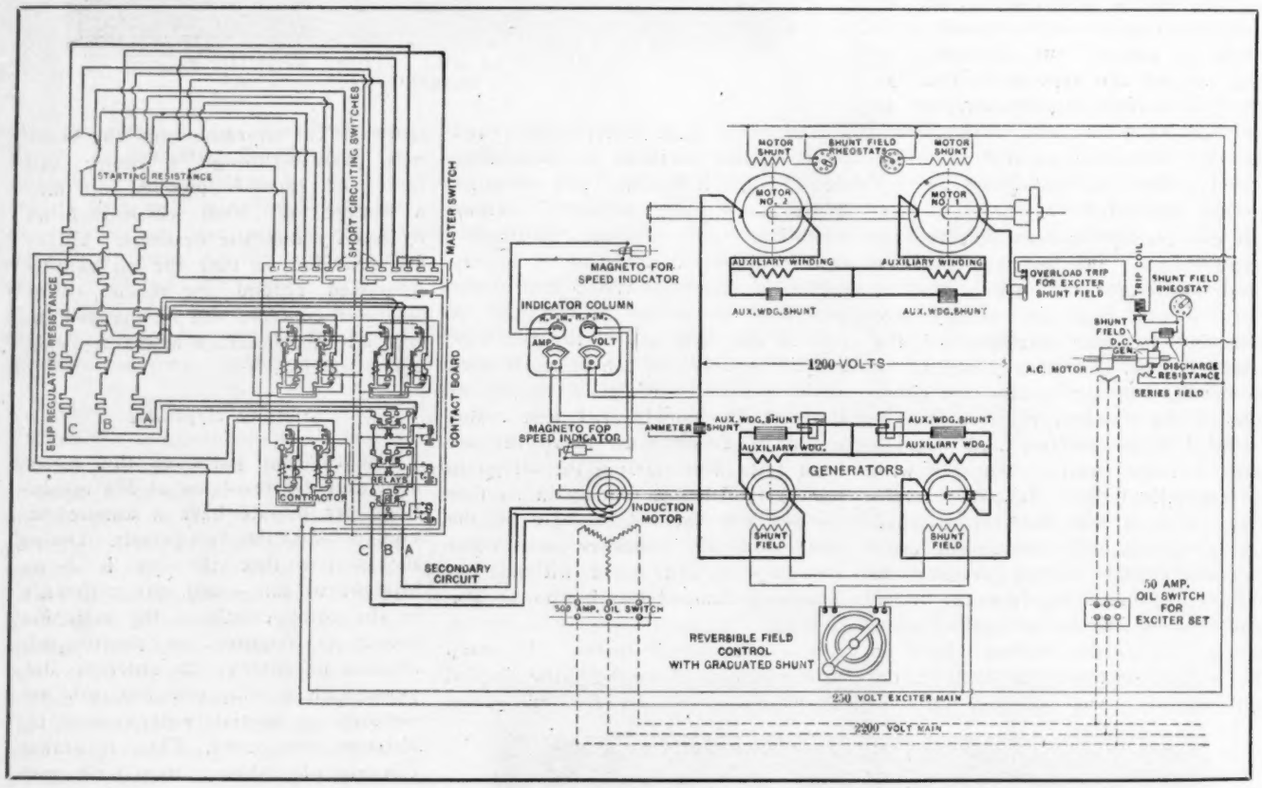


FIG. 6—DIAGRAM OF CONNECTIONS FOR ROLLING MILL EQUIPMENT

as well as the imports by countries and by classes.

There is also given a list of the lead smelters and refineries, including those idle in 1911 as well as those operating or under construction. A diagram covering the period from 1906 to 1911 inclusive shows by curves the average weekly price of lead at New York and at London. The average New York price for the year was 4.5 cents per pound, and as shown by the curve it was nearly stationary for the year. The London price gradually rose during the latter half of the year and reached the highest level since 1907. The result is seen in the increase in the exports of foreign lead from 78,586 tons in 1910 to 113,307 tons in 1911. This is correlated with a reduction of stocks of foreign lead in bonded warehouses from 35,972 tons in 1910 to 4,481 tons at the close of 1911.

In a four-page circular, R. Ardelt & Sohne, Eberswalde, Germany, engineers and manufacturers of foundry equipment, illustrate and describe a continuous cast iron pipe shop, as well as equipment used in the operation of plants of this kind. This company likewise builds cranes of all types for iron and steel foundry use.

Chambersburg Steam-Hydraulic Press

To meet the demands for the more direct application of power, the Chambersburg Engineering Co., Chambersburg, Pa., has developed a line of steam-hydraulic presses in both the single frame and four-column types. The single frame presses are built in sizes up to and including 400 tons pressure and the four-column type is built in sizes up to and including 5,000 tons capacity. The distinguishing feature of these presses is the double lever control which insures greater ease of operation. The press is controlled by two hand levers, as illustrated in Fig. 1, which perform the same functions as the two levers on a steam hammer. For this reason the operator is not compelled to make a special study of the control of these presses to ascertain the lever locations. One lever is provided for adjusting the position of the ram with reference to the stroke through which it will travel and with the throttle lever the power stroke is secured. In both instances the ram follows the direction in which the lever is moved.

Great economy in steam consumption is effected by presses of larger size by the employment of a triple intensifier. The operator can employ selective pressures in proportion to the varying necessities of the work, thereby using only the amount of steam required for the work that is being forged. It is the customary practice to use a single lever intensifier which consumes a constant volume of steam whether a press of 2,000 tons capacity is exerting 500, 1,000 or 2,000 tons pressure. A Chambersburg press of this size is arranged for three multiple pressures, respectively, 600, 1,200 and 2,000 tons, the steam consumption being in proportion to the tonnage employed.

The main frame of the 400-ton single-column press, shown in Figs. 1 and 2, is an open-hearth steel casting of I-beam section, the web being stiffened by heavy ribs with projecting flanges at the base which form a support for the press. The frame is equipped with heavy guides for the ram and is provided with a cap rigidly bolted to the front of the press to withstand strains in any direction when forging beveled work. The dies are skewed so that work will clear the frame when either drawing or finishing and the notches in the ram and die seat can be planed to suit any dovetails if existing dies are to be employed.

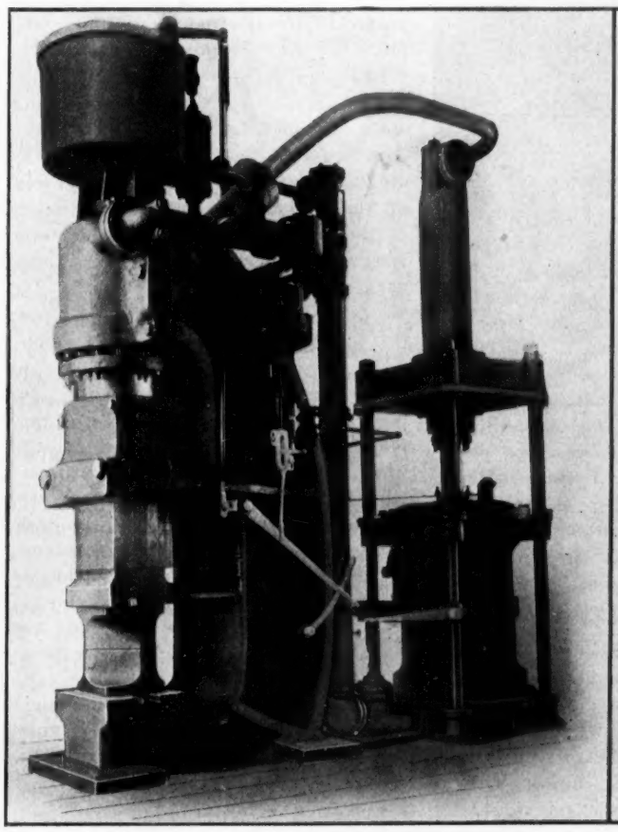


FIG. 1—OPERATING SIDE OF SINGLE-COLUMN STEAM HYDRAULIC PRESS

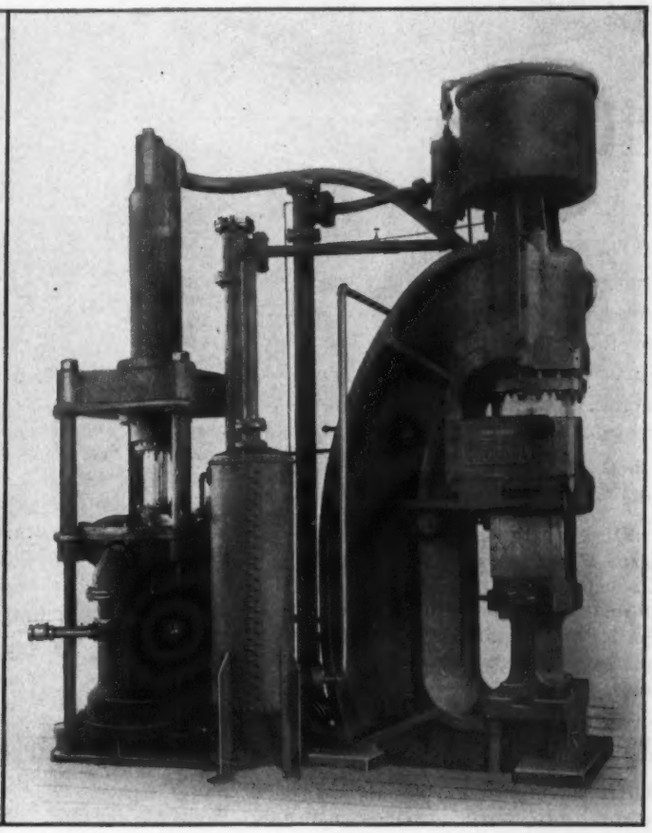
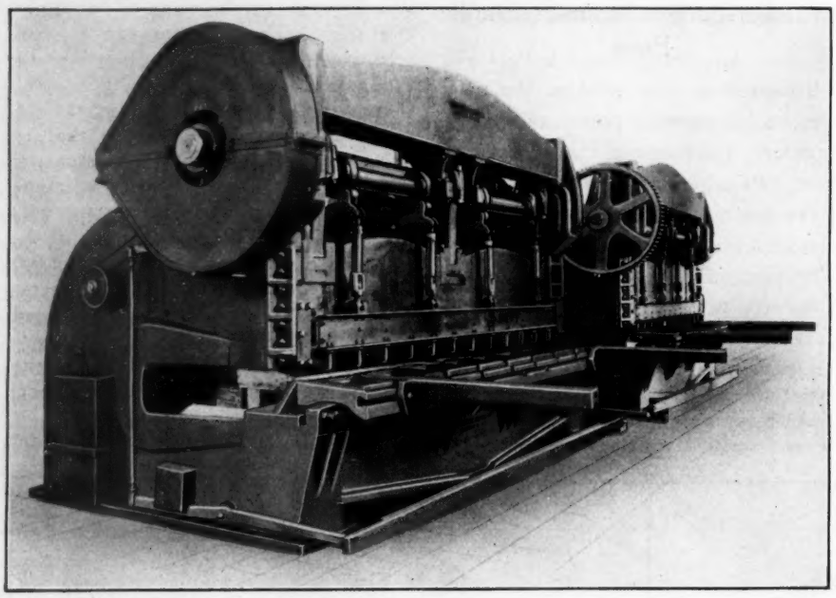


FIG. 2—OPPOSITE SIDE OF STEAM HYDRAULIC PRESS



TWO LARGE SQUARING SHEARS BUILT BY THE COVINGTON MACHINE CO.

Jobbing Mill Shears

The three jobbing mill shears installed in the plant of the Portsmouth Steel Co. Portsmouth, O, illustrated in the March 28 issue of THE IRON TRADE REVIEW, were built by the Covington Machine Co., Covington, Va. The shears are used for squaring sheets and are of unusual size, as the shear blades are 13 feet long. Two of these shears have 36-inch gaps with a capacity for splitting ⅜ x 72-inch plates of any length, while the third has an 18-inch gap with a capacity for splitting 5/16 x 36-inch plates, also of any length. The housings and main castings are made of semi-steel and the crank shafts are turned from hammered steel forgings. The clutches and gears are steel, the latter having cut teeth and the main clutch gears are provided with removable faces. The clutch mechanisms are arranged to stop the cutter bars at the top of the stroke. The automatic clamps are operated by cams on the crank shafts and securely hold the sheets in position while being sheared. The shears are carefully safe-guarded, the gears and fly-wheels being protected by guards while the counterweights for the cutter bars are all hung close to the floor. Each shear is driven by a 15-horsepower General Electric motor through a flexible coupling to the first shaft. This shaft carries the fly-wheel, which is of small diameter, owing to its high speed, and reduces to a minimum the head room occupied by the machine. Two of these shears are shown in the accompanying illustration.

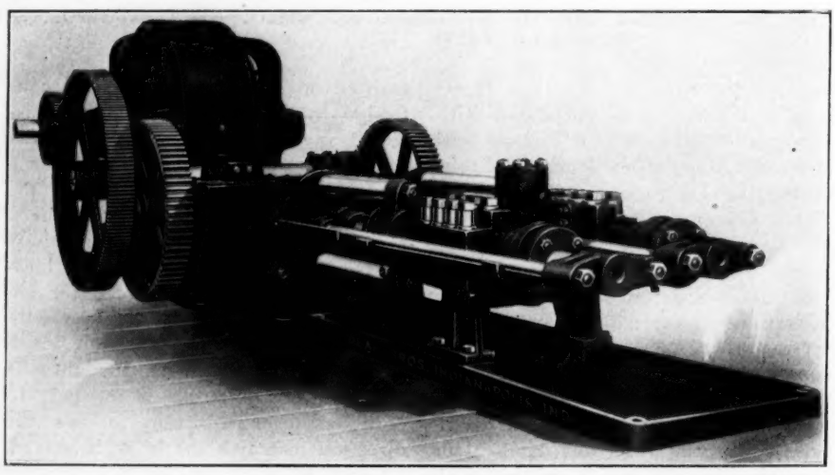
At the annual meeting of the stockholders of the Joseph Dixon Crucible Co., Jersey City, N. J., the retiring board of directors, consisting of Geo. T. Smith, Wm. Murray, Edward L. Young, Wm. H. Corbin, Geo. E. Long, Wm. G. Bumsted and Harry Dailey, were unanimously re-elected. Officers for the ensuing year were chosen as follows: Geo. T. Smith, president; W. H. Corbin, vice president; Geo. E. Long, treasurer; Harry Dailey, secretary, and J. H. Schermerhorn, assistant treasurer and secretary.

Forged Steel Pump

For pumping water to unusually high pressures the Dean Brothers Steam Pump Works, Indianapolis, has perfected a forged steel hydraulic pump which may be driven either by steam or electric motor and is designed for pressures up to 12,000 pounds per square inch. A motor-driven pump of this type is shown in the accompanying illustration. These pumps are used largely in connection with hydraulic forming presses. No cast metal is employed in the pump end of the machines. The cylinder barrels and valve plugs are machined from solid forgings and when finished have a strength sufficient to withstand any possible commercial pressure. The valve seats are removable and the valves are accessible through valve block plugs. The seats and valves are made of hardened tool steel. The valve block plugs limit the valve lift and the only gaskets on the pump are under these plugs. These are fitted in a recess and are protected by the flange on the valve block so they cannot blow out.

The plungers are ground to a cylindrical surface on dead centers and work through deep packing boxes with brass bushed throats. The packing boxes are formed by an extension of the cylinder barrels. The weight of the plunger is carried on plunger side rods which in turn rest on babbitted bearings.

Uniform pressure is obtained from the pump by setting the cranks quartering, producing four discharges per revolution, the pumps being duplex, with four single-acting plungers. The pump shown in the illustration is mounted on a drip pan which catches any oil or water and the motor is bolted to a sub-base. These machines are built with plungers ranging from 1½ to 3¼ inches in diameter, the stroke varying from 10 to 12 inches. The 3-inch pump has a stroke of 12 inches and a discharge of 1.46 gallons per revolution. Its capacity at 50 revolutions per minute is, therefore, 73 gallons. The suction is 3 inches in diameter and the discharge is 1½ inches, the ratio of motor gearing being 1 to 5.



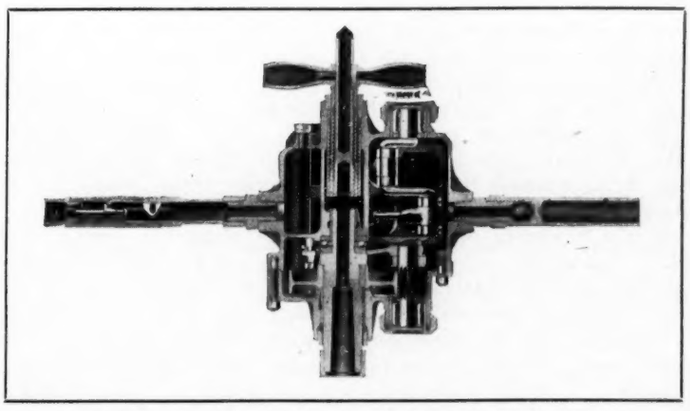
DEAN FORGED HYDRAULIC PUMP

Core Oven Installations

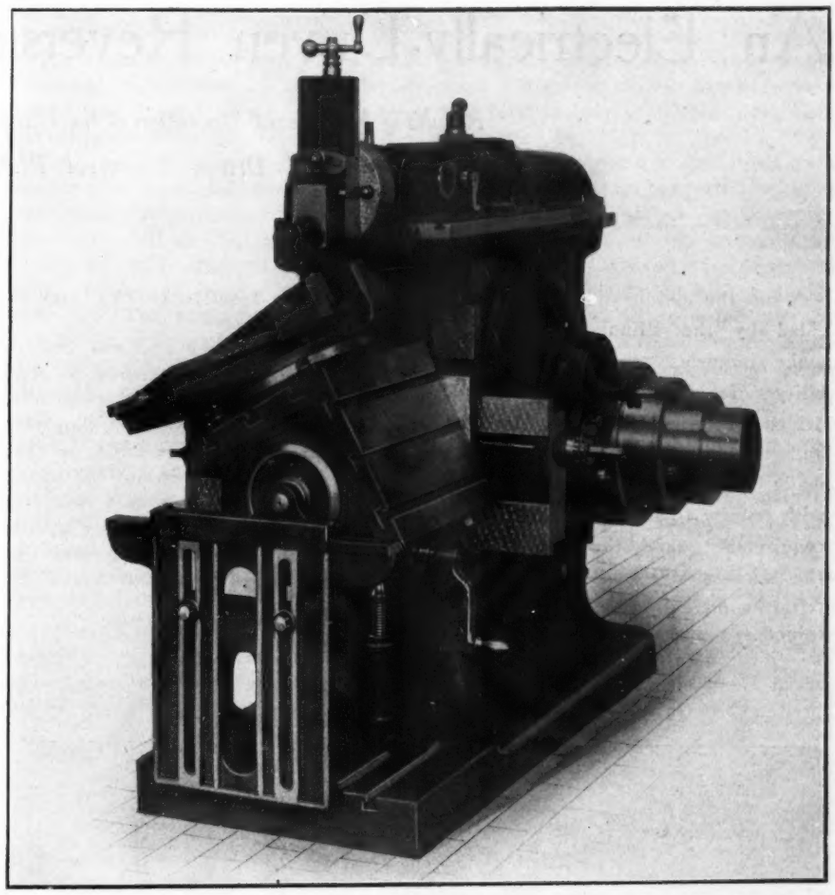
The J. D. Smith Foundry Supply Co., Cleveland, has furnished practically all of the equipment for the new foundry erected by the U. S. McAdamite Metal Co., Detroit. This plant will be devoted exclusively to the production of aluminum castings, largely for automobile work, and in addition. McAdamite metal will be manufactured for the trade. The shop is approximately 80 x 150 feet and the Smith company furnished three oil-fired core ovens of the car type, eight oil-fired aluminum furnaces, as well as other miscellaneous equipment. Core ovens also have been recently installed by the Smith company in the shop of the Medina Foundry Co., Medina, O.; Muncie Foundry & Machine Co., Muncie, Ind.; 10 core ovens in the plants of the Aluminum Castings Co., Detroit, and two in the Frontier Iron Works, Buffalo.

Roller Bearing Air Drills

The Independent Pneumatic Tool Co., Chicago, is now manufacturing a new line of portable air drilling machines which possess the same general features of construction as other types of drills made by this concern, but in addition the size of the spindle in most cases has been increased. The most radical improvements are in the crank shaft bearings, the connecting rod, eccentrics and eccentric straps. The crank shaft has been greatly strengthened and is provided with anti-friction roller bearings. The rollers are of ample length and diameter and are retained in a machined brass cage. The bushings have a slip fit into the casing and are hardened and ground. The crank shaft has rounded ends and end thrust against a hardened plate which reduces friction. On account of the increased size of the crank shaft and ample size of rollers, the center bearing is dispensed with. The toggle and connecting rod used in former types have been replaced with the one-piece connecting rod. Roller bearings also are provided for the idler or planet gears in the compound drills and an improved shifting mechanism is used on all two-speed machines. The accompanying illustration shows this drill with roller bearings on each end of the crank shaft and the one-piece connecting rod.



ROLLER BEARING PISTON AIR DRILL MANUFACTURED BY THE INDEPENDENT PNEUMATIC TOOL CO., CHICAGO



A TWO-PIECE CRANK SHAPER WITH A SUPPORTED SWIVELLING KNEE

A Supported Revolving Shaper Knee

Recognizing that the necessity for a support for a knee that revolves is just as great, if not greater than in the case of the stationary box type knee, the Stockbridge Machine Co., Worcester, Mass., is now equipping its 16, 20 and 24-inch back-geared shapers and 18-inch all-geared shapers with the support shown in the accompanying illustration. The knee is revolved by a worm and worm gear that is operated by a handle conveniently located on the working side of the knee. A graduated dial reading to degrees on the front of the knee, permits of its being set to any angle for planing bevels. One side of the knee can be furnished with a tilting top, thus making it possible to plane compound angles. The machine shown in the illustration is one of the regular 24-inch shapers, and its principal dimensions follow: Actual length of stroke, 24¾ inches; vertical travel of table, 15 inches; horizontal travel of table, 30 inches; maximum distance of the ram to table, 17 inches, and feed to head, 9 inches.

An Electrically-Driven Reversing Rolling Mill[1]

Results of Five Years' Operation of the Illinois Steel Co.'s Electrically-Driven Universal Plate Mill

By Wilfred Sykes

About the middle of 1905, it was decided by the Illinois Steel Co. to make inquiries regarding the possibility of installing an electrically-driven reversing universal plate mill, and the engineers of that company made some preliminary experiments with a view to determining the power requirements and the probability of the success of such an installation. After sufficient data had been obtained, so that a power curve could be given to the manufacturers of electrical machinery, propositions were invited, and in the spring of 1906 a contract was let for the complete installation. The machines and apparatus were designed in June, 1906, and the complete equipment was delivered by the end of the year, and started in operation at the beginning of 1907.

In the meantime, the first European installation at Hildegradehuetts was started in operation and before the plant of the Illinois Steel Co. was used commercially, a second European plant was started. It is interesting to note, however, that the installation of the Illinois Steel Co. was the second plant of this type to be ready for service. This plant has been in operation for approximately five years, and it is believed that a description of some of the details of the installation and the results obtained, may be of interest.

The Illinois Steel Co. was one of the earliest of the American steel works to utilize the blast furnace gases in gas engines, for supplying power for operating its mills, and the principal reason that led to the installation of this pioneer mill was the realization of the necessity for gteater rconomy in the generation and distribution of power in such works.

Flexibility of Drive

The characteristics of the universal plate mill are such that it is necessary to have the greatest flexibility possible in the driving machine, and it was realized that by installing an electric motor, controlled by regulating the field of a special generator supplying it with power, an ideal system would be obtained enabling all classes of work to be handled in the most desirable manner, the earlier passes being handled at low speeds and the finishing passes at high speeds, it being possible to obtain the maximum output of the mill on account of the fiexibility of the speed control.

When the plant was installed, some doubt was felt as to the possibility of quick reversing, but in operation it was soon found that the electric plant was capable of handling material more quickly than similar steam driven mills and more quickly than the material can be handled by the tables. After the plant had run for some time it was demonstrated that the electric equipment was not the weakest link in the chain. The following brief description of the mill and electrical apparatus will show, to some extent, the nature of the problem involved in the electrification and the methods adopted to insure successful operation

The mill is of the two-high universal type, designed for rolling plates up to 30 inches wide from slabs up to a maximum of 10 inches thick. The main horizontal rolls are 24 inches in diameter, and have a face of 34 inches The vertical rolls, of which there are four, two on either side of the main rolls, are 14 inches in diameter and have a face of 13 inches. The mill was designed to roll plates of all thicknesses and, on account of its flexibility, is used to a very great extent for handling small orders. The motor generator set, for supplying power to the main roll motors, is erected in the same room as the main roll motors Apart from the method of driving, the mill is not appreciably different from similar steam-driven installations.

The slabs are heated in two furnaces and are carried by an approach table to the mill. When rolled, the plates are taken in two hot beds, and after cooling, to a shearing table, where they are cut to size and are then ready for straightening and shipment. The mill tables are operated by four 50-horsepower mill motors, the control being located at one side of the mill, close to the control for

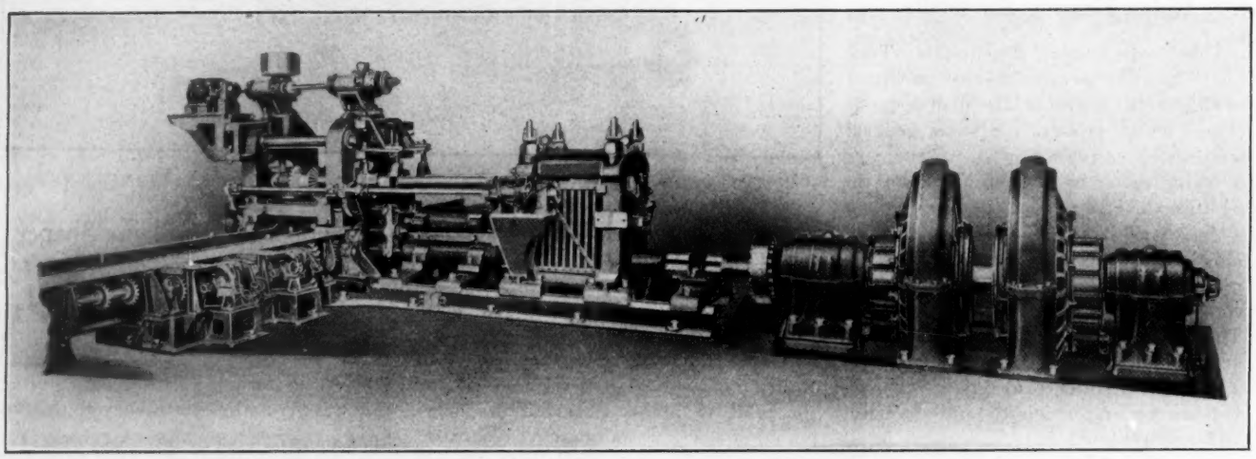


FIG. 1—UNIVERSAL PLATE MILL OPERATED BY THE ILLINOIS STEEL CO., SHOWING THE MOTOR DRIVE

[1]Presented at the meeting of the American Institute of Electrical Engineers, held at Pittsburgh, April 25-27.

the main motors The mill and the motor room are spanned by a 300-ton crane, which is capable of handling all parts of the equipment, with the exception of the flywheels of the motor generator set.

The Mill and Motors

In Fig. 1 a general view of the mill and motors is given, which shows the appearance of the complete equipment. The motors are enclosed in a separate room to protect them from the mill dust. In the illustration the auxiliary motors for the setting of the rolls are shown, that for the horizontal rolls being mounted to the left of the mill housings and that for the vertical rolls to the left of the pinion housings.

The setting of the horizontal rolls is varied by means of an electrically-driven screw-down, the screws being operated by a 50-horsepower mill type motor . The setting of the vertical rolls is controlled by means of a 30-horsepower mill type motor the position of the rolls being shown by the usual micrometer type of indicators The main rolls are connected to the pinion housing by suitable spindles, arranged to allow a movement of about 12 inches. The lower pinion is driven from the roll motor through a coupling of the usual mill type, arranged to allow for considerable wear in tthe pinion shaft bearings. No flexibility is allowed for in the drive from the motor to pinions.

The mill was designed for a maximum speed of 150 revolutions per minute, but it has been found in practice that about 100 revolutions per minute is all that can be conveniently used, on account of the comparatively short plates rolled.

The capacity of the mill varies considerably on account of the material rolled, and depends more on the product required than on its capacity for rolling, and therefore definite figures cannot be given for the output for any particular product. The performance of a mill of this type cannot be compared with that of a blooming mill, rolling practically one size of material. The equipment of this mill had to be sufficiently large to handle the heaviest slabs than can be rolled, although the work is comparatively light most of the time and consequently the tonnage suffers.

In deciding upon the system to be used for driving the mill, and the control of the motors, the experience that had been gained in the design of large hoisting plants of the Ilgner type was drawn upon. In 1903 experiments had been made to determine the posibilitty of rapid reversing and the sensitiveness of this system of control, on a large hoisting plant. The results obtained indicated that, from the standpoint of control, this system gave all that could be desired, providing the proper provision was made to obtain a rapid change in the generator field. The ordinary solid field generator cannot follow rapid change in the excitation on account of the eddy currents which are set up and which oppose any change of field strength. It is, therefore, necessary to design the machine with a completely laminated magnetic circuit so as to overcome this characteristic of the ordinary generator when working under the conditions met with in such service. The importance of having the voltage of the generator follow the changes of excitation quickly is very great from an operating standpoint and this condition has been very well fulfilled in the Illinois Steel Co.'s installation.

The roll motors are connected to a double-commutator generator without any starting resistance ,each motor being connected to one commutator. This generator is driven by means of a three-phase induction motor and a 100-ton flywheel is mounted on the same shaft. The roll motors are separately excited, the excitation being constant, with speeds up to 100 revolutions per minute, and the polarity is not changed. The direction of rotation and speed of the roll motors is controlled by changing the polarity of the generator, and varying its field strength, thereby varying the voltage applied to the armatures of the roll motors. This system avoids rheostatic losses, except in the field circuit, and enables any desired speed to be obtained, independent of the load.

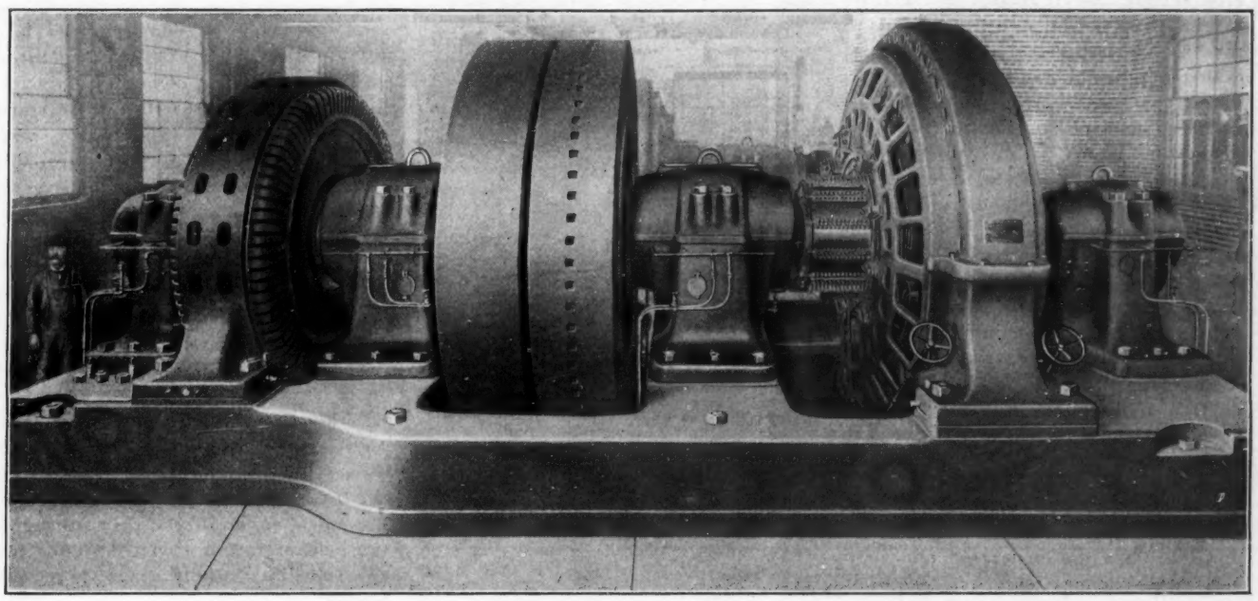


FIG. 2—MOTOR GENERATOR SET INSTALLED IN THE PLANT OF THE ILLINOIS STEEL CO.

Generator Load

The load on the generator naturally varies rapidly over a large range, the rate of change being at times 3,000 to 4,000 horsepower per second during acceleration and 8,000 to 10,000 horsepower per second when braking. From the standpoint of the power supply, such a load would be highly undesirable, even for a very large power house, and could not be handled at all by gas engine driven stations of moderate capacity, such as usually found in steel mills. In order to equ lize these fluctuations, the flywheel was provided to deliver energy

during the periods of great demand and to store energy during periods of light load, and so that the flywheel may give up some of the energy stored in it, the speed must be reduced, and to store energy the speed must be increased.

To enable the flywheel to assist the three-phase motor in driving the generator, an automatic slip regulator was provided, which introduces resistance into the rotor when the current reaches a certain value, the speed being thereby reduced, and a portion of the energy stored in the flywheel is used for driving the generator. When the load on the generator is reduced, the resistance is automatically cut out, the speed conseqently increasing and energy is thereby stored in the flywheel. In practice the maximum load on the line due to the reversing set is approximately one-fifth of the maximum load of the generator. By properly setting the regulator in relation to the work to be done the input to the motor generator can be maintained practically constant. It will be noted that the driving motor of the set is considerably smaller than the generator, which is due to the fact that the latter must be designed to carry the high peak loads and as the heating of the armature is due principally to the copper loss, which varies as the square of the current, a much greater capacity is required to deliver a certain amount of power than would be necessary if the load were constant. The load on the induction motor does not vary greatly and consequently it is designed to carry only the average load.

Overload Trips

To protect the generator and driving motor against excessive overloads, due to stickers or cold slabs, overload trips for the circuit breakers are provided in each armature circuit, which are arranged to open the circuit at a load corresponding to, approximately, 8,000 horsepower. The primary circuit of the induction motor is provided with the usual instruments and overload protection. Speed meters showing tthe speed of the rolls, and double reading ammeters are provided on the operating pulpit, for the guidance of the operator. It has been found, however, that the electrical equipment is capable of performing heavier work than the mill so that the operators are controlled during rolling more by the limitations of tthe mill than those of the electrical equipment.

The driving motors have a nominal rating of 2,000 horsepower each, making a total of 4,000 horsepower for the set. The motor was divided into two units, with the object of reducing the armature diameter, and consequently the inertia, and at the same time to facilitate handling the heavy current which at 8,000 horsepower is about 11,000 amperes. They are designed for a normal armature voltage of 75, and 220 volts excitation.

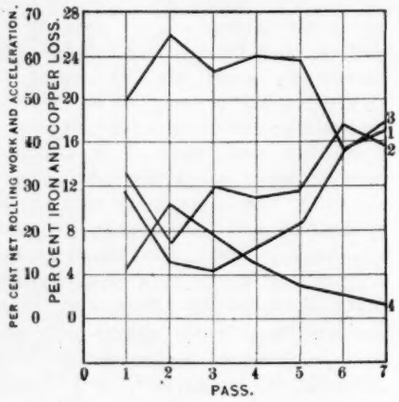


FIG. 3—ANALYSIS OF POWER INPUT TO ROLL MOTORS WHEN ROLLING PLATE (SEE FIG. 6)

1.—Percentage of net rolling work to total input. 2.—Percentage of acceleration work to total input. 3.—Percentage of friction and iron loss to total input. 4.—Percentage of copper losses to total input.

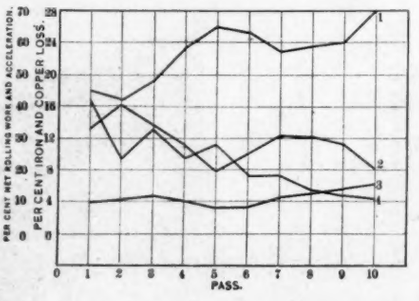


FIG. 4—ANALYSIS OF POWER INPUT TO ROLL MOTORS WHEN ROLLING PLATE (SEE FIG. 7)

1.—Percentage of net rolling work to total input. 2.—Percentage of acceleration work to total input. 3.—Percentage of friction and iron loss to total input. 4.—Percentage of copper losses to total input.

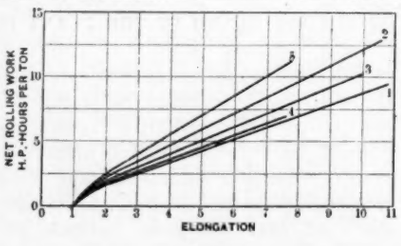


FIG. 5—TYPICAL TESTS, SHOWING POWER REQUIRED TO ROLL PLATES FROM SLABS

Slab, inches.	Plate, inches.	Temperature, degrees, Fahr.
1.—4 x 21.5 x	95 to ¾ x 21¼	2,160 to 1,536
2.—4 x 21.5 x	60 to ⅜ x 21½	2,172 to 1,578
3.—4 x 8 x	100 to ¾ x 8⅜	2,208 to 1,944
4.—6 x 9½ x	90 to ¾ x 10	2,076 to 1,830
5.—6 x 7¾ x	82 to ¾ x 8	2,016 to 1,692

When the plant was designed, it was proposed to increase the speed from 100 to 150 revolutions per minute for the longer passes, and, so as to insure that the flux in the motor fields would follow the quick changes of the exciting current, the magnetic circuit was laminated. Experience gained from the operation of the plant has shown that this refinement was unnecessary although required in order to meet the original guarantees for acceleration and reversal asked for.

The two armatures of the machines are mounted on one shaft, supported by two bearings, the field frames being mounted side by side on the bed plate. The laminations are supported by a cast iron frame which is split horizontally to facilitate repairs. The machines are of the commutating pole, compensated type, the compensating windings being imbedded in the face of the main poles. The armatures, which are 7 feet, 6 inches in diameter, were especially constructed to stand the severe shocks anticipated with this class of work and to be capable of withstanding the severe stresses due to the rapid reversing and acceleration. On this account, very great attention was paid to the methods of supporting and holding the armature windings, a special steel ring being provided to support and fasten the end connections rigidly where they connect to the commutator lugs.

Although very high efficiency in the motors of such an installation is not of very great importance, considering the other losses, yet it is desirable, inasmuch as it affects the heating of the machines, and a well designed machine will naturally have high efficiency.

Motor Generator Set

The generator of this set is of the double-commutator type, and embodies some design features of special interest. It was decided to use a double-commutator type machine, so as to reduce the current to be collected from a single commutator, thereby allowing a single comparatively high speed machine to be used. The field is of the laminated type, so built that it will answer changes of field current very rapidly, this being necessary to obtain quick reversing and speed changes. The machine is of the commutating pole compensated type, similar to the roll motors, the diameter of the armature being the same. The normal full speed of the generator is about 375 revolutions per

minute and the minimum speed about 300 revolutions per minute. At 375 revolutions per minute, the voltage of the generator with full field is, approximately, 600.

The generator is designed for a normal capacity of approximately 3,000 kilowatts and a maximum capacity of about 6,400 kilowatts. Special attention was given to the design of the generator, to insure good commutation under the severe conditions of operation. The commutating pole and compensating windings are not shunted, care being taken to render this unnecessary, so as to avoid any trouble due to difference in the self-induction of the windings and shunt affecting the division of the current with rapid changes of load. The necessity of commutating the maximum current with a weak field, requires that the closest attention be given to commutating characteristics of the generator. The motor for driving the generator and flywheel has a normal rating of 1,300 horsepower, and is designed for three-phase, 25-cycles, 6,600 volts, eight poles. It is of the wound rotor type, the rotor circuit being controlled by an automatic slip regulator, previously referred to, and is of the usual standard construction.

The Flywheel

The flywheel of this set presents some interesting features, as, owing to difficulties in transportation and in obtaining reliable steel castings, the wheel was built of comparatively thin punched laminations on a steel spider, the sheets being bolted between cast steel end rings The peripheral speed of the wheel at 375 revolutions per minute is 15,500 feet per minute. In order to facilitate handling, the wheel is built in two parts, each weighing 100,000 pounds, the total weight therefore, being 100 tons. The flywheel effect of this wheel is 5,500,000 foot-pounds, and under normal conditions of operation, the speed of the set seldom falls below 320 revolutions per minute, and the input does not as a rule exceed about 900 kilowatts. The energy stored in the wheel at full speed is 250,000 horsepower seconds, and the amount given up when the wheel slows down to 300 revolutions per minute is 90,000 horsepower seconds.

A view of the complete machine is shown in Fig. 2. The rotating parts are supported by four bearings, the flywheel having a bearing on either side and a separate shaft. The shafts for the motor and generator are supported at one end by a bearing, and at the other are bolted to the flywheel shaft. The maximum bearing pressure has been limited to approximately 80 pounds per square inch. Both machines and the flywheel are mounted upon a single base plate, which is securely fastened to the foundation by numerous bolts. All bearings are water-cooled and oiled from a central gravity oil system so as to insure a continuous supply of oil to all wearing parts. In order to facilitate starting the set, a pneumatic barring gear is provided, controlled by a hand-operated triple valve.

For controlling the excitation of the generator, a special controller, operated on the principle of a Wheatstone bridge, was designed. The current handled by this controller is, approximately, 50 amperes, with maximum excitation, which can be readily handled by a controller of the face plate type. The slip regulator for auomatically varying the rotor resistance, so as to limit the input, consists of a number of pneumatically-operated switches, arranged in groups, their operation being controlled by two relays. One of these relays causes the switches to drop out when the current in the primary of the motor reaches a certain value, and so long as this relay is open the switches will continue to drop out successively. When the current reaches a normal value the relay closes and no further switches are opened. When the current falls below the normal, the second relay drops, and causes the switches to automatically close in the proper order, and in this way the input to the motor, under normal operating conditions, is maintained approximately constant.

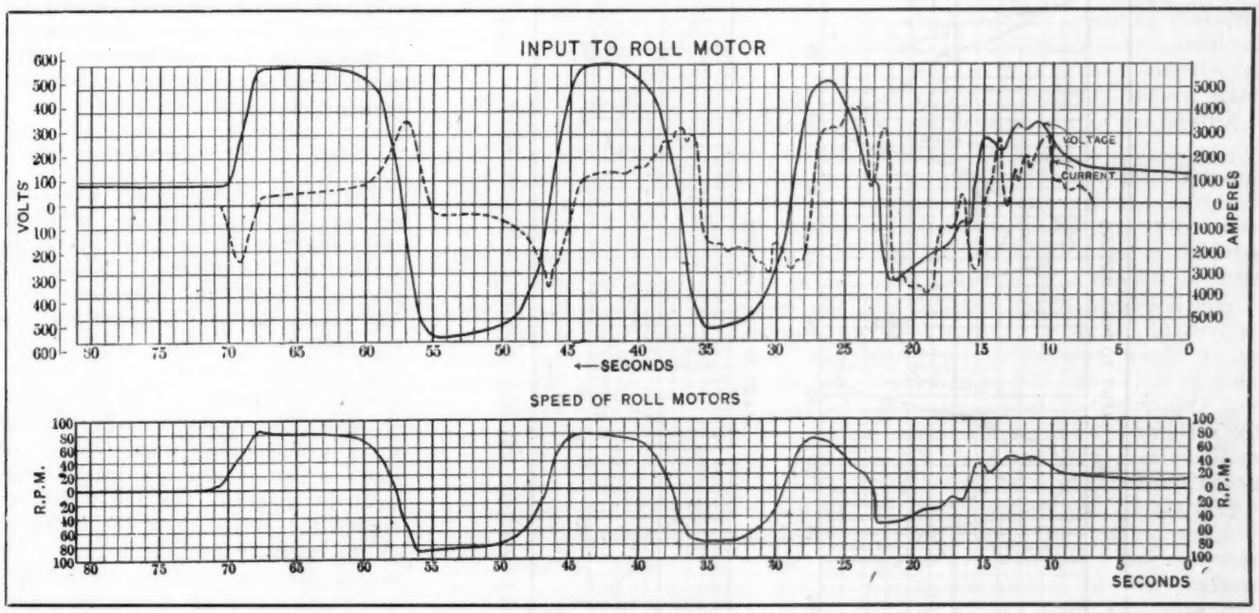


FIG. 6—TEST CURVES, SHOWING INPUT TO ROLL MOTORS AND SPEED WHEN ROLLING SLAB 3½ x 11½ x 94.9 INCHES TO PLATE 5-16 x 12 INCHES (SEE DETAILS UNDER FIG. 3)

Test Results

After five years' operation of the plant, it was decided that it would be advisable to make a complete set of tests, to determine, not only its operating characteristics, but also whether such an installation could be improved upon and how closely the designed capacity approximated to the actual operating conditions. Owing to the difficulty in obtaining suitable apparatus to make such tests, most of the instruments were specially designed and built for this test. The current in the motors varies, under normal conditions, so rapidly that ordinary

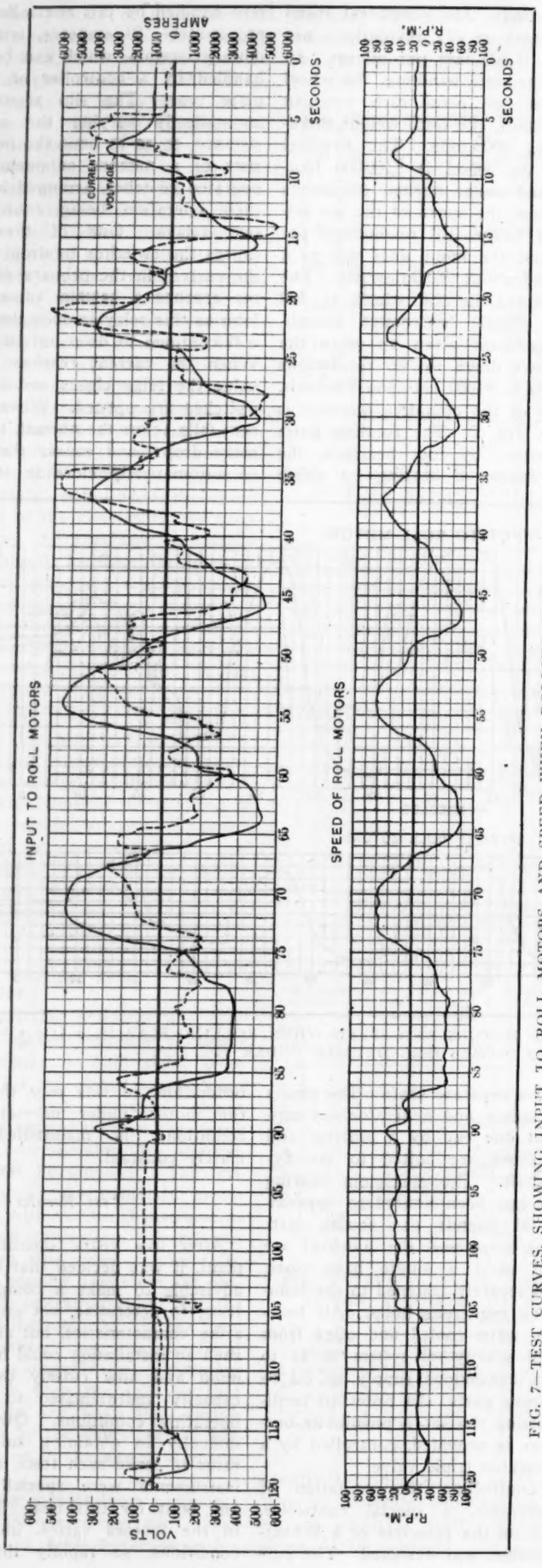


FIG. 7—TEST CURVES, SHOWING INPUT TO ROLL MOTORS AND SPEED WHEN ROLLING SLAB 3 x 30¼ x 75.9 INCHES TO PLATE ¾ x 33 INCHES

indicating or recording instruments were not suitable and it was, therefore, decided to use an ascillograph for recording the direct-current voltage and current. The speed of the roll motors was recorded by means of a special graphic recording meter, controlled by a suitable magneto, driven from the motor shaft. The recording instrument was especially designed so as to be capable of following rapid changes in speed, and to avoid errors usual with graphic instruments. It was decided to avoid the use of a pen for recording and the position of the pointer was recorded by causing a spark to pass from the end of the pointer through the paper to an insulated plate. In designing these instruments provision was made to avoid introducing errors in the readings due to the static effect of the high-tension current for the spark. The speed recording instrument for the roll motors had a center zero so as to record both directions of rotation.

Speed of Motor Generator Set

The speed of the motor generator set was also recorded, to determine the amount of energy given up or absorbed by the flywheel, during the period of test. The instrument used was similar to that adopted for the recording of the motor speed, except that provision was not made for recording the speed in both directions. In order to obtain a large reading for a comparatively small change of speed, a battery was connected to oppose the magneto, and the meter recorded the difference in the potential of the magneto and the battery. All the instruments, including the oscillograph and the speed meters, were provided with a time recording device, all of these attachments being controlled by a single contact-making clock.

The input of the motor generator set was determined by means of a wattmeter of the same type as the speed meters. In addition to the above apparatus, provision was made for recording signals from the mill. In the mill, records were obtained as to the size and weight of material rolled and the reduction per pass, and at the same time readings were taken to determine the temperature of the metal. These tests gave, simultaneously, readings of the input to the roll motors and the input to the motor generator set at the speed of the set and motors. With this information, together with the known characteristics of the apparatus, and the data obtained as to the work done by the mill, it was possible to

obtain a complete analysis of the power requirements and operating characteristics. While it is not possible within the scope of this paper to go into detail as to these tests, a few characteristic curves are given which may be of interest.

Power For Rolling Slab

Fig. 6 shows the power required for rolling a slab, 3½ x 11½ x 95 inches, weighing 1,080 pounds to a plate 5/16 inch thick by 12 inches wide, and 1,060 inches long. From these curves it will be seen that the maximum current was approximately 4,100 amperes, and the maximum braking current about 2,350 amperes. The maximum speed of the rolls during this test was 86 revolutions per minute during the sixth pass, whereas in the first pass the maximum speed was 50 revolutions per minute. The total time required from beginning to end of the test was 58 seconds, showing a maximum capacity when rolling this size material of approximately 30 tons per hour. The temperature of the metal varied during the test from 1,920 degrees Fahr. to 1,800 degrees Fahr.

In Fig. 3 is shown an analysis of this test, which gives the relation between the total input to the roll motors and the various items. It will be seen that the percentage of net rolling work averages about 55 per cent. The input required for acceleration is about an average of 30 per cent. The loss due to friction of the mill and from loss in the motors is approximately 10 per cent.

The reason for the very large drop in the percentage of net roll work in the last two passes, is the fact that the draft was comparatively light on these two passes.

The comparatively large proportion of the input required for acceleration shows the importance of keeping the inertia as low as possible, and the great advantage of the voltage control system is that it enables a considerable proportion of this energy to be recovered. In this particular test, the total energy required to accelerate the motors for the seven passes was 11,800 horsepower seconds, and there was returned by the motors to the generator 8,317 horsepower seconds, or somewhat more than 70 per cent. It should be noted that with this system the energy taken from the generator is only half what it would be if rheostatic control were used and that with the latter system none of the energy would be recovered. In this test if rheostatic control had been used, the total energy required for acceleration would have been 23,600 horsepower seconds, which would have increased the total net input to the motor about 50 per cent.

In Fig. 7 are shown the curves when rolling a slab 3 x 30 x 76 inches weighing 1,960 pounds to a plate ⅜ inch thick x 30 inches wide. The total time of the test was 100 seconds, indicating a maximum capacity of the mill when rolling these slabs of approximately 36 tons per hour.

It will be seen from these curves that the maximum loads are considerably higher than shown in Fig. 6. In this case, tthe maximum current input is slightly in excess of 6,000 amperes, and the braking current reaches a maximum of, approximately, 3,150 amperes. The maximum speed of the mill did not exceed 75 revolutions per minute during any pass. The temperature of the metal during this test varied from approximately 2,040 to 1,300 degrees Fahr.

Analysis of Test

In Fig. 4 is shown an analysis of this test, from which it will be seen that the percentage of net rolling work to the total input gradually increased, and the percentage of power required for acceleration, decreased. The copper losses decrease on account of the maximum current being smaller, and naturally the friction loss increases as the mill is running the greater percentage of the time. The percentage of energy returned by the roll motors was about 62 per cent of the input for acceleration.

In Fig. 5 are shown some curves of the net rolling work per ton plotted against elongation and it will be seen that the variation is considerable. The difference in the total power required may show a much greater variation than given but these curves will indicate in a general way how the net rolling work varies with the displacement of the metal. In a test made when rolling a certain slab, in 7 and in 15 passes, the net rolling work showed a difference of about 10 per cent, but the total input varied about 50 per cent, due to the reduced capacity of the mill when rolling at the lower rate. Such points as these show the importance of a very close examination of operating conditions when designing a mill of this kind, and to insure success an electrically-driven reversing rolling mill requires very careful engineering, as the problem is not so much to get a mill that will work, as to get one that will work economically.

In this mill it is the general practice during the earlier passes, to have the feed rolls running at full speed in the opposite direction to main rolls, so that when the slab leaves the mill, it is returned in the shortest possible time. In spite of this, the main motors are easily capable of reversing in ample time. An examination of a large number of tests on this and other mills, shows that the average rate of acceleration used does not exceed about 20 revolutions per minute of the rolls per second, the maximum being about 30 revolutions per minute per second. The rate of retardation is, however, very much greater and generally varies between 40 and 50 revolutions per minute per second.

Efficiency of Plant

The overall efficiency of the plant depends in the first place upon the size of equipment to the material to be rolled. As already pointed out, a mill of this kind cannot be compared to one rolling only a single product, in which case the operating characteristics can be very accurately predicted. As this mill will be often underloaded, the efficiency naturally suffers, which is true, independent of the system of driving.

The results obtained from this mill indicate that, although the equipment was built six years ago, it compares very favorably with some of the latest designs and is quite capable of meeting the most severe service it may be called upon to perform. In new designs, certain features would be improved upon, with the object of somewhat simplifying the equipment from a manufacturing standpoint, but it is not believed that any great improvement could be made from an operating standpoint, as since it has been in regular service the electrical equipment has given no trouble. The experience gained has shown that the engineers of the Illinois Steel Co. were thoroughly justified in undertaking this pioneer installation without having any precedent whatever to work upon.

Will Manufacture Trucks.—The Atlantic Vehicle Co. has been organized and has equipped a plant in Newark, N. J., for the manufacture of electric trucks made in units of 1, 2, 3½ and 5 tons. McKinley Boyle, president of the Continental Car Co., Louisville, Ky., is president and Ralph S. Sanger, formerly with the machinery house of Wonham, Sanger & Bates, New York, is vice president and sales manager. Arthur J. Slade, a well-known truck engineer, is chief engineer.

S. D. Henry has been granted a new franchise at Coon Rapids, Ia., for an electric light plant and will install new machinery and extend the transmission line to Deadham, Ia.

THE IRON TRADE REVIEW

DEVOTED TO THE IRON, STEEL, MACHINERY AND FOUNDRY INDUSTRIES

Published Every Thursday by

The Penton Publishing Company

CLEVELAND

CHICAGO - - - - - - - - - - 1328 Monadnock Blk.
CINCINNATI - - - - - - - - - 503 Mercantile Library Bldg.
NEW YORK - - - - - - - - - - 1115 West St. Bldg.
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BIRMINGHAM, ENG. - - - - - - - - Princes Chambers

Subscription, United States and Mexico $4.00 per year
Canada and other Foreign Countries $5.50 a year

Copies published three months or more previous to date of current issue, 25 cents each

All communications relating to changes of advertising copy, discontinuances, etc., must be received ten days prior to to the next publishing date.

Entered at the Postoffice at Cleveland as Second Class Matter

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Cleveland, May 2, 1912

A Patriotic Enterprise

Much gratification in business circles is being expressed over the recent very apparent revival of shipbuilding activity in the United States. This has been especially marked among the yards along the Atlantic coast. Practically all the leading plants located along the eastern seaboard now have their ways full of work and contracts upon their books, which insure their full activity for one, and in some places, for two years ahead. In addition, there is a large tonnage now in the market or in some stage of arrangement, which contributes strongly towards making a very favorable outlook for the future of the industry over the next several years, at least. Veteran shipbuilders in the east make the statement that never in their careers have they seen so many projects and such a volume of construction as is now active before the industry. Some of them are authority for the declaration that the American shipbuilding industry from an eastern standpoint, at least, is now apparently entering upon the most generally active period in all its history. Encouraging reports are also coming from the Pacific coast.

The surmounting stimulus for this revival of American shipbuilding is generally ascribed to the approaching completion of the Panama canal, which way will reduce the sailing time between New York and San Francisco by more than half. It promises to be of incalculable value to American commerce in opening up and extending trade with South America, Hawaii and southwestern markets, which will be linked by means of it, more accessibly to the eastern seaboard. Making due provision for the possibilities of the canal in this respect, steamship interests are now actively engaged in mapping out and constructing new lines of boats which will afford improved transportation facilities of adequate extent and dispatch.

The iron and steel industry has a large share of interest besides that of the mere furnishing of the material for the new vessel construction, in the revival of shipbuilding and in its main cause, the opening of traffic through the Panama canal. In addition to extending their opportunities in the export line, to which the industry is turning more and more, the shorter water route will make the Pacific coast more readily accessible to steel makers and should enable them to strive more energetically to fill the requirements of the western coast, which so long have been commanded, to a great extent, by foreign competitors.

Commercial enterprise has constantly been the foreword of American progress. The Panama canal, conceived and now practically executed under the impulse toward extended markets, promises likewise to be a strong agency in a patriotic direction. With the upbuilding of shipping enterprise should come, in a considerable measure, the re-establishment of the American Merchant Marine, and the re-appearance of the American flag in many ports from which it has been almost wholly missing in recent years. If the Panama canal will help to re-establish the force of an auxiliary craft under the American flag and to refill the depleted ranks of a trained seamanship, invaluable as a protective support in time of stress, it will have served the nation even better than some of its originators may have foreseen. It should prove a boon to those who have been laboring with energy and patriotism in the hope of stirring the appreciation of the American people, to the dangers lurking with the absence of a proper merchant marine and to the measures calculated to correct the peril of such deficiency.

More Steel Than Pig Iron Made Last Year

The statistics of production of steel ingots and castings in the United States in 1911, as compiled by the American Iron and Steel Association, make a considerably better showing than the pig iron statistics for the year, which were given in our issue of Feb. 1. While in pig iron the year 1911 fell behind 1906, 1907, 1909 and 1910, in steel the year fell behind 1909 and 1910 only. A curious fact is that the production of steel, for the first time in history, exceeded the production of pig iron. We give the figures below, in gross tons:

	PIG IRON.	STEEL.
1905	22,992,380	20,023,947
1906	25,307,191	23,398,136
1907	25,781,361	23,362,594
1908	15,936,018	14,023,247
1909	25,795,471	23,955,021
1910	27,303,567	26,094,919
1911	23,649,344	23,675,501

The 1911 pig iron production fell close to that of 1905, exceeding it by only about 650,000 tons. The 1911 production of steel ingots and castings, however, exceeded that of 1905 by about 3,650,000 tons. Steel gained about 3,000,000 tons as compared with pig iron.

There were two reasons for this. There was a large decrease in pig iron stocks in 1911, for estimates of pig iron at furnace at the beginning of 1911 ran from 1,500,000 to 2,000,000 tons, while at the close of the year the stocks were very small. There was a large decrease in stocks, probably exceeding 1,000,000 tons. Of steel there were practically no stocks either at the beginning or close of the year. This explains at least 1,000,000 tons of the 3,000,000 tons. The remainder is explained by the rise of the basic open-hearth process.

In 1905, there was produced 7,815,728 gross tons of basic open-hearth steel ingots and castings, but in

1911, 14,685,932 tons, an increase of 6,870,204 tons. Neglecting the gain in steel due to the use of ore, as well as the losses due to slag, oxidation, etc., these being of quite minor import, it may be said that basic open-hearth steel is made from pig iron and scrap. The production of basic pig iron in 1905 was 4,105,179 tons, and in 1911, 8,520,029 tons, an increase of 4,414,850 tons, whereas the steel increased 6,870,204 tons, the gain in steel being more than 2,000,000 tons in excess of the gain in pig iron.

The proportion of basic pig iron to basic open-hearth steel produced in 1911 was 58.1 per cent, which is lower than in 1910 or 1909 by a couple per cent, but higher than the proportion in any year prior to 1909. The average for the three years 1909-10-11 was between 59 and 60 per cent, while in 1901, when the proportion was lowest, it stood at 40 per cent. This increase from 40 per cent to 60 per cent in a decade means, of course, that the proportion of scrap used in making basic open-hearth steel has greatly decreased. This decrease was by no means uniform at all the works. Probably at many plants approximately the same pig and scrap mixture is used as formerly. The difference is probably caused almost wholly by the rise of the non-scrap processes, using little, if any, scrap, such production pulling down the general average of scrap used. It is needless to emphasize the fact that the difference between the pig iron and scrap, representing in 1911 some 6,000,000 tons, is not wholly or chiefly old material. It is chiefly new scrap, produced at the steel works, or at related Bessemer steel works. The production of finished rolled steel, therefore, is much less than the production of steel as commonly reported. Much of the material passes over the ingot scales twice, and is thus doubled up in the familiar statistics of "steel ingots and castings".

Increasing Installation of Converters

(From *The Foundry.*)

Notwithstanding a decline in the total steel casting production of approximately 30 per cent in 1911, as compared with 1910, the falling off in the output of castings made by the converter process was less than 2 per cent. The greatest decrease was in the tonnage of open-hearth steel castings, whereas the crucible product remained practically stationary. To be exact, the steel casting output last year totalled 646,022 tons, as compared with 940,832 tons in 1911. Of last year's output of steel cast sections, open-hearth steel foundries contributed 571,191 tons, against 863,351 tons in 1910, a decrease of 292,160 tons. Of the total converter production of steel castings in 1911, 3,216 tons were made by the standard Bessemer process, 26,211 tons by the Tropenas process, and 27,669 tons by the Bookwalter and other modifications of the Bessemer process. The total converter steel casting output in 1911 was 57,096 tons, against 58,335 tons in 1910. In 1909, only 33,814 tons of converter castings were made. These statistics reflect the output of the large number of converter installations during the last two years and the growing appreciation of this method of steel production, which can profitably be limited to small heats. Many gray iron shops, to meet a local demand for steel castings, recently have installed converters and this practice is growing in all sections of the country. The tonnage of crucible steel castings in 1911 was 14,030, compared with 14,632 tons in 1910. The output of electric steel castings in 1911 was 1,878 tons, and in 1910, 1,320 tons. This marks a rapid growth in the product of the electric furnace when the 306 tons made in 1909 are considered for purposes of comparison.

Some Contented Workmen

(EDWARD M. THIERRY, IN *Leslie's Weekly.*)

A man, wrinkled of feature, but rugged of frame, lightly carrying his threescore years and seven, rose to greet me.

"Yes, I'm a steel worker—and a type, not a curiosity," he said, squaring his broad shoulders and drawing up his full 6 feet of muscle and sinew.

He had been 44 years in the service of a Pittsburgh steel plant. I had gone to see some of the older men in but one of three dozen Carnegie mills.

"I'm not really old," he continued, "though I've done what they call the 'hard work of the steel business' since I was 23. I've never broken down, neither have my boys—I have two sons right here in the mill. I'll have to retire soon, but not because I want to. I've been in harness a long time and I'll have to do something—or die. Yes, I've worked 36 hours at a stretch in the olden days—and I'm still here in the mills, where I've been since 1869. They won't let me do that now and I can't work more than six days a week."

He's still working, as are others whom I saw and talked to. So I found them, hundreds of them, who had grown gray in the great mills.

One can find many types of laboring men in the huge industrial plants of Pittsburgh and environs, well named the workshop of the world. There one can seek the evil that is persistently exploited and the good that is little known—and there one will find much good and few of the alleged labor conditions, undemocratic and destructive.

One mill has 294 employes and it is a pertinent fact that one out of every three has worked in the Carnegie service 20 years and over. Eighty-nine of them, or 30.2 per cent, have worked two decades, while 35, or 11.9 per cent, have been employed 30 years and over. I looked for the average workers, not the freaks or preserved centenarians, kept for exhibition purposes. Scores are over 50, many in the sixties and not a few past the 70 mark. They had worked as long as 53 years, many starting before, during and just after the civil war. One can talk with these veterans, thousands of them in the Carnegie employ, and find the type of men who have done their share toward the success of the steel business, who have worked more than the average life's span and are not eager to lay down their tools and retire to idleness. There are about 35,000 employes of the Carnegie Steel Co. in 32 mills in the Pittsburgh and eastern Ohio districts.

I talked with men employed in the Homestead mills and elsewhere, and found contentment apparent everywhere, with an absence of labor unrest.

To me the reason seemed to be satisfaction and security, purchased by humane working conditions, protection from danger and an employes' welfare system that probably is more extensive and worthy than any other in existence.

The trouble has been that the public has known too little of the steel industry and its workers. Imagination, born of hearsay and nurtured by exaggeration, has conjured up weird pictures of oppression.

MEN OF THE IRON TRADE

Henry P. Brown, of the Philadelphia bar, selected by the federal government and accepted by counsel for the United States Steel Corporation to take testimony in the suit pending looking to the dissolution of the Corporation, is rated one of America's greatest lawyers. In Philadelphia, where he has spent all his years, he ranks with John G. Johnson, George F. Baer, T. Dewitt Cuyler, Samuel Dickson, Abraham Beitler and the other leaders of that famous bar and frequently meets men like George S. Graham, Alexander Simpson, S. Davis Page, John Cromwell Bell and Hampton L. Carson in the courts in the trial of celebrated cases and has several times refused appointments to the common pleas bench and to the supreme court of Pennsylvania. When the superior court was first organized, Mr. Brown was the first man suggested for a place upon this "technical" bench, but he declined to permit his friends to press his claims, as he frankly asserted he could not afford to make the great sacrifice involved through the necessary loss of revenue from his lucrative private practice.

Mr. Brown was born in Philadelphia, Oct. 15, 1852, and at 60 years of age has the alertness of a man of 40 but is not lacking poise and dignity. He is not only a profound lawyer, viewed from the purely legal standpoint, but he is a great pleader and a finished orator. The classics of the law are familiar to him and his general reading covers the gamut of literature. He has never permitted himself to be drawn into political affairs, but on occasions when it was necessary for some one to speak with decision and authority on some public question affecting the judiciary or the office of the district attorney, by common consent Mr. Brown has always been selected for the task.

His public school education completed, Mr. Brown entered upon the study of law in the old fashioned way. When but 23 years of age, he was appointed, in 1875, to the office of assistant United States district attorney under John Valentine, who was his law partner in the name of Valentine & Brown. This partnership continued until 1898, when Mr. Valentine died. Mr. Brown retired from public office in 1888, because of the increasing demands of his private practice and devoted himself most assiduously to corporation law until 1904, when the federal government invited him to assist Hon. J. Whitaker Thompson, United States district attorney for the eastern district of Pennsylvania, in the prosecution of Henry Lehr, president, and George Philer Brock, cashier, of the wrecked Doylestown National Bank. The sum involved directly in the cases of record was only $70,000, but the aggregate sum was in excess of $1,500,000, and the finest points of the banking law were turned in the trial of the cause. Both Lehr and Brock were men of vast political power in Pennsylvania and their personal friends were legion, including, strangely enough, many of those who

HENRY P. BROWN
Who Will Hear Testimony in Suit Against Steel Corporation.

were robbed by them. This case proved to be one of the sensations of the banking as well as of the legal world and the points scored by Mr. Brown will remain in legal text books so long as the present laws governing the management of national banks prevail. Both Lehr and Brock were convicted and sentenced to the Eastern penitentiary.

Mr. Brown maintains a suite of offices in the Land Title building, one of the largest of the many office buildings in Philadelphia, and his residence at No. 128 West Upsal street, Germantown, is one of the show places of that exclusive suburb.

Mr. Brown, of course, declines to discuss the case of the Steel Corporation in any way beyond intimating that the hearings will probably be held in New York, for the convenience of all concerned. He says his only function will be to take testimony, much as a master, and to submit the testimony as taken and transcribed to the court above.

Joseph G. Butler Jr., vice president of the Brier Hill Steel Co., Youngstown, O., was the leader last week in a civic campaign to secure $100,000 to erect a hospital in that city. Mr. Butler succeeded in instilling such enthusiasm among the employes of the steel mills and women and men in other walks of city life, that the contributions will probably reach $125,000, the fund being only a few thousand dollars short of that sum after a six days' campaign. The activity displayed by Mr. Butler was contagious and the success of the campaign was assured from the time he consented to head the executive committee. In commenting upon the successful campaign, the *Youngstown Telegram* says of Mr. Butler: "It is to the credit of the city to possess such an admirable character, a man who will sacrifice his own personal ends, important as they might be, and devote his entire time to such a deserving philanthropy."

S. L. Reynolds, Grand Rapids, Mich., has been appointed resident manager for Pittsburgh of the Fort Wayne Electric Co., to succeed James Kent, resigned.

J. E. Stafford has been appointed assistant auditor of works for the Inland Steel Co., Chicago. He has been auditor of the William Tod Co., Youngstown, O.

Charles M. Schwab, president of the Bethlehem Steel Corporation, has left for a tour of inspection in the Pacific coast region, in the interests of the corporation.

Paul M. Warburg of Kuhn, Loeb & Co., New York, has been elected a director of the Westinghouse Electric Mfg. Co., succeeding Chas. A. Moore, resigned.

Gunni Jeppesen has been named managing engineer of the Strauss Bascule Bridge Co., Chicago. He

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had been designing engineer for a number of years.

Louis McCarthy, treasurer of The Macallen Co., Boston, Mass., is making a trip through the west in the interest of the company. He will return about the first of June.

John P. Congdon has opened offices in the Empire building, Boise, Ida., as a consulting engineer. He was formerly supervising engineer of the Oregon Short Line railroad.

W. J. Hoskin, who has been master mechanic of the Chicago & Alton railroad at Bloomington, Ill., has been appointed master mechanic of the Illinois Central railroad at Paducah, Ky.

Herbert W. Topping, of Parker & Topping, founders and machinists, Brainerd, Minn., has just returned from a trip around the world. He sailed from Vancouver, B. C., in November.

Carl A. Smarling, who has been assistant chief tool designer for the Locomobile Co., Bridgeport, Conn., has accepted the position of chief tool designer with the American Motors Co., Indianapolis, Ind.

Reginald P. Dryer has been appointed sales manager of the Canada Foundry Co., Toronto, Can. He was formerly head of the sales department of the William Tod Co., Youngstown, O.

A. J. Wallace, formerly connected with the Philadelphia office of Matthew Addy & Co., Cincinnati, as a salesman, has resigned and accepted a similar position with E. J. Levino & Co., Philadelphia.

Ernest L. Whiton, who for 26 years has been with the D. E. Whiton Machine Co., New London, Conn., has accepted the position of treasurer of the newly organized New London Marine Iron Works.

W. H. Hamilton, general manager of the Coatesville, Pa., plant of the Lukens Iron & Steel Co., spoke on the "A B C of Steel Making" at a meeting of railroad master mechanics at Boston recently.

Charles S. Howe, president of Case School of Applied Science, Cleveland, will begin a 14 months' vacation on July 1. He will travel during that time and will not resume his duties until September, 1913.

T. S. Bailey, who has been chief engineer of the New England Ship & Engineering Co., Groton, Conn., has accepted the position of Pacific coast manager for the Electric Boat Co., with headquarters in Seattle, Wash.

B. H. Tripp has been appointed district manager of New England for the Chicago Pneumatic Tool Co., Chicago, with offices at 191 High street, Boston. He has been engaged in special work at the Philadelphia office.

L. H. Burnett has been named as assistant to President A. C. Dinkey, of the Carnegie Steel Co., Pittsburgh. In addition to performing the duties of assistant he has been placed in charge of the accident and relief bureaus.

E. W. Lazell has become a member of the firm of Edwards & Lazell, consulting and chemical engineers, Portland, Ore. He was formerly with the Sprackmann Engineering Co., Philadelphia, and later, consulting engineer of the Charles Warner Co., Wilmington, Del.

W. W. Gaffin and **F. Gehri** have formed a partnership under the name of Gaffin & Gehri for the general practice of engineering with offices at Fond du Lac, Wis. Mr. Gaffin was division engineer of the Chicago & Northwestern railway at North Fond du Lac, Wis., for a number of years.

H. A. Goode, of Wonham, Sanger & Bates, Inc., 30 Church street, New York, will leave on May 16 for a trip through Argentina and Brazil, for the purpose of representing specialties manufactured in the United States. The company acts as representative for engineers, contractors and manufacturers.

W. H. Sherwin, for ten years northwestern representative of Joseph T. Ryerson & Son, Chicago, has been appointed general manager and vice president of the Alberta-American Ornamental Iron Co., Redcliff, Alta. This company has succeeded the American Ornamental Iron & Steel Co., Minneapolis, Minn., and is moving its entire plant to Redcliff.

Steven P. Brown, formerly chief engineer of the Tide Water Building Co., New York, has been appointed engineer in charge of the tunnel through Mount Royal, which the Canadian Northern railway will build to reach the heart of Montreal. He has had supervision over the construction of certain New York subways and a portion of the cross-town tunnels of the Pensylvania railroad in New York.

Charles T. Jeffery, president of the Thomas B. Jeffery Co., automobile manufacturer, Kenosha, Wis., has been elected president of the Manufacturers' Association of Kenosha. The new board of directors comprises Mr. Jeffery; William L. Yule, of the Badger Brass Mfg. Co.; George H. Allen, of the American Brass Co.'s Kenosha branch; W. J. Frost, of the Frost Mfg. Co., and W. W. Vincent, of the Simmons Mfg. Co.

J. W. Fraser, who has been assistant chief engineer of the Southern Power Co., has resigned in order to assume charge of the building of a complete hydro-electric power plant and transmission system for the British Westinghouse Electric & Mfg. Co., in Australia. He has been with the Southern Power Co. for seven years and has attracted attention in hydro-electric and high tension plant construction and operation.

Michael Gleason, Gladstone, Mich., is the president of the newly-organized Gleason Mining Co. He owns the fee of several of the properties now being operated at Iron River, Mich., and has been engaged in prospecting on the Menominee range for several years. Richard Schell, Duluth, Minn., is vice president. Other directors are E. G. Hildfard, Duluth; M. J. Murphy, Ely, Minn., and M. E. Gleason, Benton Harbor, Mich.

Cecil A. Robinson, president of the board of trade of Wheeling, W. Va., and former district manager of the American Sheet & Tin Plate Co., was stricken with paralysis a few days ago while attending a meeting of the directors of the Hazel-Atlas Glass Co., Clarksburg, W. Va. His condition is serious. Since his retirement from the American Sheet & Tin Plate Co., two years ago, Mr. Robinson has spent most of his time in traveling in search of health.

Capt. Thomas Walters, Negaunee, Mich., manager of mines for the Jones & Laughlin Steel Co., Pittsburgh, is quoted as advising consumers who own their own ore to keep it and fill their requirements from the mines of owners who are willing to sell at this year's lowered prices. In speaking of general conditions, Capt. Walters said: "We entered upon the present year

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with prospects that led everybody to believe it would be one of the most prosperous ever known. It will be a good year, but too much politics has hurt the prospects somewhat."

W. W. Brown and C. D. S. Clarkson have organized the firm of Brown & Clarkson, mining and topographic engineers, with offices in the Southern building, Washington, D. C. Mr. Brown spent eight years as topographer for the United States geological survey and for nine years was engaged in mining and railway construction and location in the United States, Alaska and Mexico. Mr. Clarkson was topographer in the United States geological survey for ten years and for one year was hydrographic surveyor for the navy department in Cuba.

Rudolph Diesel, D. E., D. Sc., was elected to honorary membership in the American Society of Mechanical Engineers at a meeting held in the auditorium of the Engineering Societies building, 29 West Thirty-ninth street, New York, on the evening of April 30. Mr. Diesel, who is a director of the Verein Deutscher Ingenieure and the inventor of the Diesel engine, is making a tour of this country to observe the progress of oil-fed motive power. Following the election, he gave an illustrated lecture on "The Development of the Diesel Engine."

Sir Robert Hadfield, F. R. S., of England, has been elected to membership in the Royal Swedish Academy of Science, Stockholm, Sweden. His election is "a token of its appreciation of his excellent work in metallurgy." says the society's notification of the election. The honor is all the higher from the fact that there are only 26 foreign members of the society, representing science in all parts of the world. The six other members in the technical sciences class, to which Sir Hobert Hadfield was elected, are Thos. A. Edison, Silvanus P. Thompson, Sir W. H. White, Henry Marion Howe, V. Marconi and Henri Le Chatelier. In his presidential address before the Iron and Steel Institute in 1905, Sir Robert Hadfield pointed out that the world has been greatly indebted to the early Swedish workers, who may be said to have made possible the present modern development of metallurgy.

Clarence E. Whitney, elected at the fourteenth annual convention of the National Metal Trades Association, at New York, April 11, as a member of the administrative council for two years, is president and manager of the Whitney Mfg. Co., Hartford, Conn., which he organized in 1896. He has been associated with only two manufacturing concerns during his active business career of 22 years. Mr. Whitney left the Massachusetts Institute of Technology, Boston, in 1890, and went to Berlin, Germany, where he spent several months. Returning, he became associated with the Pratt & Whitney Co., which had been organized by his father, Amos Whitney, and F. A. Pratt. In 1896, he left and organized the Whitney Mfg. Co., and has acted as president and manager of that company since its organization. He is ranked high among the progressive business men of New England and the National Metal Trades Association gains by his selection as councilor.

OBITUARIES

Jacob E. Friend, president of the Nordberg Mfg. Co., Milwaukee, Wis., died suddenly of heart failure at Florence, Italy, on April 20. With his wife and daughter he had been touring Europe and the Holy Land, and expected to sail this week for home. Mr. Friend was born in Milwaukee 54 years ago and was the only child of Elias Friend, one of the founders of the vast Friend Bros. clothing interests of that city. He graduated from the Columbia University law school and served in the Wisconsin assembly. He gave up the practice of law five years ago to take an active interest in the management of the Nordberg Mfg. Co.

Hugh Addison Reed, one of the most prominent machine tool men in the Pittsburgh district, died at his home in that city last week. He was 58 years old, and had been in failing health for a year. Mr. Reed was born in Pittsburgh and at an early age became interested in the business which he followed for more than 40 years. He was one of the first men in the machine tool business to engage in business in Pittsburgh. At the time of his death, he was president of the Baird Machinery Co., 123 Water street, Pittsburgh. He was a member of the Engineers' Society of Western Pennsylvania and the Tecknicher Verein.

Charles G. Hickox, vice president of the Gardner Electric Drill & Machinery Co., Cleveland, died last week at his home in that city. He was 66 years of age, and had been in ill health for more than a year. He had been a vice president of the Toledo & Ohio Central railroad and of the Adams-Bagnall Electric Co. At the time of his death, he was a director of the Hocking Valley Railroad Co., the Kanawha & Michigan Railway Co., the Cleveland & Mahoning Railway Co., and the National Acme Co.

Charles Hart, proprietor of the Reliance Machine Works, Frankford, Pa., died recently at his home in that city. He was 56 years of age and had been ill for some time. He was born in Frankford and had lived there all his life. He was a member of the board of managers of Wrights Institute.

Jesse J. Pitts, treasurer of the Massillon Iron & Steel Co., Massillon, O., shot and killed himself April 26. Worry over ill health is said to have caused the action. He was 48 years of age.

Iron and Steel Securities

Prices on the New York stock exchange last week reached the highest average in more than a year. The advance was due to renewed optimism brought about during the latter part of the week by favorable developments in labor disputes.

Monday, the market was irregular and prices averaged lower; wheat, corn and cotton were higher owing to unfavorable crop reports. Tuesday, the general list was carried up to near the highest level of the year; the impending engineers' strike on 50 eastern railroads was submitted for government arbitration; grain markets lower in spite of unfavorable reports. Wednesday, the market was reactionary and closed lower for the active issues. Thursday, the market displayed a reversal of sentiment, prices advancing to the highest average of the year; grain markets excited and higher. Friday, the general average of all stocks reached the highest for more than a year. Saturday, stocks were only moderately active, but a number of specialties advanced to the highest mark of the year; wheat advanced to a new high price and closed at the top.

Money on call ranged between 3 and 2½ per cent. Time money was somewhat firmer at the close of the week, due to an increase in demand. The actual condition of clearing house institutions showed loans increased $589,000; net deposits increased $6,935,000; total reserve, $437,621,000; and the excess of reserve $19,677,050, a decrease of $141,950. Non-member banks and trust companies showed loans decreased $1,222,700; net deposits decreased $2,725,600; reserve on deposits increased $142,900, and the percentage of reserve 19.2, against 19 the week previous. Bank clearings showed a decrease of 7.5 per cent from the preceding week and an increase of 17.4 over the corresponding week last year. Commercial failures numbered 310, compared with 310 the preceding week and 232 the corresponding week last year. Shares were sold to the number of 3,586,200, compared with 3,172,388 the preceding week and 1,772,600 the corresponding week a year ago. Bonds, exclusive of government bonds, were sold to the amount of $12,434,000, compared with $15,026,000 the preceding week and $14,792,000 the corresponding week a year ago.

	Clos'g Quo. Apr.27	Changes in week.	Annual Meeting date 1912	Stock Outstanding	Basis.	Dividend Last Dividend	Dividend Date Last Div. Pay
Allis-Chalmers	7⅛	— 3/8		$19,820,000		.....	
Allis-Chalmers, pr	31¼	— ¼		16,050,000	7 cum.	1¾ Q.	Feb., 1904
American Can	38¼	+4⅛	Feb. 6	41,233,300		.....	
American Can, pr	116	— ⅜		41,233,300	7 cum.	1¾ Q.	Apr., 1912
Am. Car & Fdy	60¾	+1⅜	June 27	30,000,000	2	½ Q.	Apr., 1912
Am. Car & Fdy., pr	118⅛	+1⅛		30,000,000	7 n. c.	1¾ Q.	Apr., 1912
American Loc	44	+ ⅝	Oct. 15	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	108⅞	+ ¼		25,000,000	7 cum.	1¾ Q.	Apr., 1912
American Ship	50⅞	.....	Oct. 9	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	102⅜	.....		7,900,000	7 n. c.	1¾ Q.	Apr., 1912
Am. Steel Foundries	37⅛	+1⅜	Mar. 21	17,184,000	5	1¼ Q.	May, 1911
Barney & Smith	10	.....	June 4	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr	85	.....		2,500,000	8 cum.	2 Q.	Dec., 1911
Bethlehem Steel	38	—1¾	April 2	14,862,000		.....	
Bethlehem Steel, pr	72⅝	+ ⅞		14,908,300	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	44¼	+ ¼	Mar. 19	45,000,000*	5	1¼ Q.	May, 1912
Cambria Iron	44	.....		8,468,000*	4	2 S. A.	Apr., 1912
Chicago Pneumatic Tool	49	+1½	Feb. 19	6,448,800	4	1 Q.	Apr., 1912
Colorado Fuel	30	— ½	Oct. 21	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	123¼	— ¼	Nov. 15	24,578,400		.....	
Crucible Steel, pr	84	+ ½		25,000,000	7 cum	1¾ Q.	Mar., 1912
Empire Steel	10	.....	Feb. 28	1,254,770		.....	
Empire Steel, pr	36	.....		2,500,000	6 cum.	2 S. A.	July, 1911
Fay & Egan	70	.....	Feb. 20	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....		1,000,000	7 cum.	1¾ Q.	Feb., 1912
General Electric	170¼	+ ¼	May 14	77,281,200	8	2 Q.	Apr., 1912
Harbison-Walker	39	—1	Jan. 15	18,000,000	2	½ Q.	Mar., 1912
Harbison-Walker, pr	98½	.....		9,600,000	6 cum.	1½ Q.	Apr., 1912
International Pump	31	+ ¾	Dec. 10	17,762,500		½ Q.	Apr., 1905
International Pump, pr	82	—1¾		11,350,000	6 cum.	1½ Q.	May, 1912
Lackawanna Steel	29	.....	Mar. 13	34,978,000		.....	
Lake Sup. Corp	31	— ½	Oct. 2	40,000,000		.....	
New York Air Brake	55	— ¼	Mar. 13	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	95	.....	Feb. 7	8,500,000	6	1½ Q.	Mar., 1912
Niles-Bement-Pond, pr	101	.....		2,000,000	6 cum.	1½ Q.	Feb., 1912
Otis-Elevator Co	75	.....	Mar. 18	6,358,600	4	1 Q.	Apr., 1912
Otis Elevator Co., pr	101	+2		6,375,300	6 n. c.	1½ Q.	Apr., 1912
Pa. Steel	60	.....	May 13	10,750,000		.....	
Pa. Steel, pr	100	—2		20,587,500	7 n. c.	3½ S. A.	May, 1912
Pittsburgh Coal	22¼	— ⅜	Mar. 12	28,104,600		.....	
Pittsburgh Coal, pr	90	+1¼	Oct. 7	27,071,800	7 cum.	1¼ Q.	Apr., 1912
Pittsburgh Steel Co., pr	102	.....	Feb. 21	7,000,000	7 cum.	1¾ Q.	Mar., 1912
Pressed Steel Car	36½	+1¼		12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	103	.....	Nov. 13	12,500,000	7 n. c.	1¾ Q.	May, 1912
Pullman	161	.....	Mar. 7	120,000,000	8	2 Q.	May, 1912
Railway Stl. Spring	37	+3¼		13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	100	.....	Oct. 16	13,500,000	7 cum.	1¾ Q.	Mar., 1912
Rep. Iron & Steel	24⅜	+ ⅝		27,191,000		.....	
Rep. Iron & Steel, pr	79¾	+1⅛	Mar. 13	25,000,000	7 cum.	1¾ Q.	Jan., 1912
Sloss-Sheffield	52	+4		10,000,000	5	1¾ Q.	Sept., 1910
Sloss-Sheffield, pr	102	.....	June 26	6,700,000	7 n. c.	1¾ Q.	Apr., 1912
U. S. Pipe & Fdy. Co	18⅜	— ⅛		12,500,000		1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr	55¼	—1¾	April 15	12,500,000		1¼ Q.	June, 1911
U. S. Steel	71⅞	+1		508,302,500	5	1¼ Q.	Mar., 1912
U. S. Steel, pr	113½	+1		360,281,100	7 cum.	1¾ Q.	Feb., 1912
U. S. Steel 5s	102¼	+ ⅛	Sept. 17	465,189,500	5	5 Q.‡	
Va. Iron, Coal & Coke	64	.....	Oct. 1	9,073,680		.....	Oct., 1907
Westinghouse Air Brake	169¾	+1¾	June 12	14,000,000*,		5. †	Apr., 1912
Westinghouse Electric	76¾	+1⅝		3,998,700*	7 cum.	1¾ Q.	Apr., 1912

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Include 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated Copper closed 84¾, a net gain of 1½.

Boston.—Anaconda closed 43, a net loss of ¼; Calumet & Arizona closed 73¾, a net loss of ¾; Calumet & Hecla closed 493, a net loss of 2; North Butte Mining closed 32, a net loss of 1; Quincy Mining closed 92½, a net gain of 3½.

Financial Notes.

The Pullman Co. has declared the usual quarterly dividend of 2 per cent, payable May 15.

The International Harvester Co. has declared its regular quarterly dividend of 1¾ per cent on preferred stock, payable June 1.

The Pope Mfg. Co. has declared the regular quarterly dividend of 1½ per cent on preferred stock, payable April 30.

The Canadian Locomotive Co. directors have decided that after July 1, which ends the company's fiscal year, dividends on preferred stock will be paid quarterly instead of half-yearly, as heretofore.

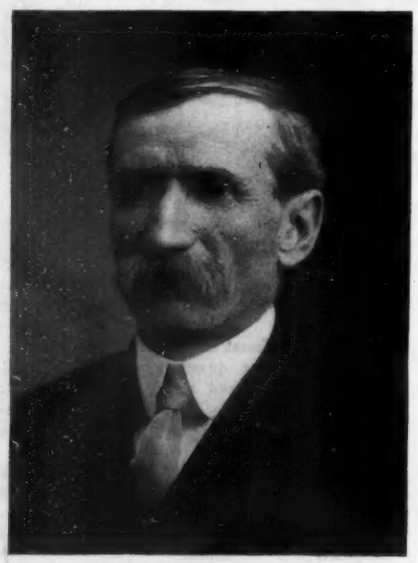
The directors of the Triumph Electric & Ice Machine Co., Oakley, Cincinnati, recently paid the fifteenth quarterly dividend of 1½ per cent on the preferred stock, amounting to $2,250.

STEADY PROGRESS

Being Made by United Metal Trades Association of Pacific Coast.

The sixth annual convention and banquet of the United Metal Trades Association of the Pacific Coast was held at the Hotel Multnomah, Portland, Ore., April 19 and 20. Delegates were present from all sections covered by this association, including British Columbia. From a numerical standpoint, the convention was no more successful than previous ones, but what was lacking in numbers was made up in enthusiasm.

An interesting report was made by the president, H. T. Clarke, on the work of the association during his term of office. He gave a brief review of the strikes which occurred during the past year, and reported the condition in the shops at the present time from a labor standpoint is everything that could be desired. He stated business conditions have been very poor on the coast during the past year. The secretary's report showed that during the year he had sent to members of the association 1,366 men, this being an increase of 92½ per cent over the previous year. The strike of the machinists and other shop employes on the Harriman lines absorbed considerable attention in labor circles on the Pacific coast during the past year. The sympathy of the public has apparently been with the railroads and they now have the strike well in hand. All of their plants in the far west are operating on full schedules with a complete complement of men. The shops, however, are still being picketed and there has been considerable violence.



JOHN HARTMAN

President of the United Metal Trades Association of the Pacific coast, and manager of the Atlas Foundry & Machinery Co., Tacoma.

The secretary of the Oregon district stated there had been an increase in membership since the last convention and that practically all concerns within the jurisdiction of the district are now members. He compared the condition of the association a year ago with that of today, the change being very encouraging. Reference was made to the efficient employment bureau which is maintained in connection with the Seattle office and the Portland members were urged to make similar use of their office.

An interesting report was made by the Spokane delegation. The Inland Empire district, with headquarters in Spokane, was formed about a year ago and during that time they have taken into membership all metal trade firms in that vicinity with the exception of two. These two non-members employ a total of only six to eight men. Membership in the Spokane district now includes not only the jobbing shops but the railroad shops as well.

Representatives from the Federation of Employers' Associations of the Pacific Coast were present and reviewed the progress of the year toward uniting all employers on the west coast. It was decided that the United Metal Trades Association become a member of this federation.

Letters and congratulatory telegrams were received from Los Angeles and San Francisco associations, from John Kirby Jr., president National Association of Manufacturers; O. P. Briggs, president National Founders' Association, and others.

F. W. Phelps, editor of the *Pacific Coast Mechanic*, an open-shop publication issued in Seattle, told of the Protherhood of Independent Mechanics, of which he is the head, and explained the movement on foot to combine it with the Trades' and Workers' Association, of Battle Creek, Mich. Mr. Phelps stated that the object of this association was not only to give the men a social organization but an organization which the employer can join and talk over matters which are of mutual interest to the employer and employe. This association aims to make better mechanics of the members and to regulate their pay strictly according to their ability.

It was the sense of the meeting that, although business is quiet and probably will be during the year, it is important that there be no lessened activity on the part of the Metal Trades Association. No changes were made in the policy of the organization.

A. M. CLARK

Treasurer, United Metal Trades Association of the Pacific coast and superintendent of the Columbia Steel Co., Portland.

The following officers were elected: President, John Hartman, manager Atlas Foundry & Machinery Co., Tacoma, Wash.; first vice president, A. G. Labbe, treasurer Willamette Iron & Steel Works, Portland, Ore.; second vice president, F. G. Frink, Washington Iron Works, Seattle, Wash.; third vice president, J. M. Fitzpatrick, manager Union Iron Works, Spokane, Wash; treasurer, A. M. Clark, superintendent Columbia Steel Co., Portland, Ore.

The sixth annual banquet was held Saturday evening, April 20, at the Multnomah hotel, Portland. H. T. Clark, the retiring president, was toastmaster. Speeches were made by John Hartman, the newly-elected president, Carl Jackson, president of the Employers' Association of Oregon, George James, of Seattle, W. H. McMoines, president of the Manufacturers' Association of the Northwest, Stanley Mayall, of Spokane, James Howard, of Vancouver, B. C., and F. W. Phelps, of Seattle.

Contract Awarded.—The Builders' Iron Foundry, Providence, R. I., has received a contract from the government to furnish a number of 12-inch mortar carriages for coast artillery defenses. Each carriage weighs about 50 tons each. The biggest single casting for the work will be about 15 inches in diameter and weighs about 13 tons. The carriage will be of gray iron and steel. The Watertown arsenal is also building 12 carriages of the same type.

NAME CHANGED

To American Institute of Metals—Meeting in Buffalo.

The name of the American Brass Founders' Association, by an overwhelming vote of its membership, has been changed to the American Institute of Metals. In addition, a change in the by-laws has been made which provides that the institute shall meet in convention each year at the time and place selected by the executive committee instead of the time and place chosen for the annual convention of the American Foundrymen's Association. The American Institute of Metals will hold its annual meeting in Buffalo during the week of Sept. 23, when the foundrymen's organizations will meet. Headquarters have been established at the Hotel Iroquois where the meetings of this society will be held. The American Foundrymen's Association has selected the Hotel Statler for its headquarters and the Foundry and Machine Exhibition Co., the Lafayette hotel.

A large number of papers already have been prepared and those already received by the program committee follow:

"The Rare Earth Metals, with Especial Reference to Pyrophoric Alloys," by Dr. A. Hirsch.
"Phenomena Connected with the Tarnishing of Metals," by Prof. C. F. Burgess.
"Vanadium Alloys," by G. L. Norris.
"Work of Bureau of Mines as it Relates to Non-Ferrous Metal Industry," by Prof. C. L. Parsons.
"The Practical Use of Equilibrium Diagram," by Dr. W. Campbell.
"The Difficulties Experienced in Casting German Silver," by C. P. Kerr.
"The Electric Furnace for Brass and Bronze and Its Efficiency," by G. H. Clamer.
"The Influence of Pouring Temperature on Manganese Bronze," by H. W. Gillett.
"The Successful Handling of Manganese Bronze and Other Alloys in a Reverberatory Furnace," by W. R. Dean.
"Progress of Work on Boron Sub-oxide as Used as a Deoxidizer in Non-Ferrous Metals," by E. Weintraub.

Papers also are being prepared by Dr. W. R. Whitney and W. S. Landis.

Papers to be Read

The list of papers announced is unprecedentedly large and including committee reports, more than 150 manuscripts are promised. About 35 American papers are included in the list. The proceedings of the congress will be conducted in English, German and French, with the aid of competent interpreters. Among the foreign papers already received are the following:

"Resilience of Red Copper," by H. Baucke.
"Investigations of Bearing Metals for Machines."
"Methods of Testing Cast Iron," by Asboth and Kail.
"Nature of the Welding of Iron and Steel and Practical Applications," by M. Bermann.
"Changes in the Physical Properties and Structure of Tool Steel When Heated from 600 to 1,000 Degrees Cent.," by Z. Fabry.
"Testing Consignments of Steel and Iron on the Basis of Their Chemical Composition," by M. Bermann.
"Principles for the Organization of Public Laboratories for Testing Materials," by A. Martens.
"Electric Resistivity of Special Steels," by O. Boudouard.

Special delegates to attend the congress have been appointed by the following foreign governments: Great Britain, France, Spain, Sweden and Switzerland and by the following societies and institutions: University College, Cork, Ireland; Institution of Civil Engineers of Great Britain, Iron and Steel Institute of Great Britain, Institution of Mining and Metallurgy of Great Britain, Engineering Standards Committee of Great Britain, Geological Survey of Great Britain, National Physical Laboratory, British Fire Prevention Committee, International Testing Association of Great Britain, Institution of Naval Architects of Great Britain, Institution of Mechanical Engineers of Great Britain, Lloyds Register of British and Foreign Shipping, American Society of Mechanical Engineers, American Institute of Mining Engineers, Society of Naval Architects and Marine Engineers, American Museum of Safety, American Railway Engineering Association, Association of American Portland Cement Manufacturers, American Foundrymen's Association, Society of Automobile Engineers, Institute of Operating Engineers, American Association of Manufacturers of Sand Lime Products, American Railway Bridge & Building Association and the American Society of Heating and Ventilating Engineers.

SPRING MEETING

Of A. S. M. E. in Cleveland—Subjects To Be Discussed.

The date of the spring meeting of the American Society of Mechanical Engineers has been changed to the last week of May, opening at Cleveland on Tuesday, May 28, and closing on Friday, May 31. The professional sessions will be held in the hall of the Chamber of Commerce. On Tuesday, registration headquarters will be opened at 10 a. m. and in the afternoon, from 4 to 6 p. m., an informal reception will be tendered the visitors at the home of Mr. and Mrs. Ambrose Swasey, 7808 Euclid avenue. In the evening, a membership reunion and informal reception will be held in the Chamber of Commerce hall.

A business session will precede the professional meeting on Wednesday morning, at which a paper will be read, entitled "A New Analysis of the Cylinder Performance of Reciprocating Engines," by J. Paul Clayton. The gas power section likewise will meet on Wednesday morning and "Problems in Natural Gas Engineering" will be discussed by Thomas R. Weymouth. In the afternoon the members will be afforded an opportunity of inspecting local manufacturing and power plants. In the evening a lecture will be delivered by Dr. D. C. Miller at the Case School of Applied Science on "Sound Waves, How to Photograph Them, and What They Mean." At the professional session on Thursday morning the following papers will be presented: "New Process for Chilling Cast Iron," by Thomas D. West; "Strength of Steel Tubes, Pipes and Cylinders Under Internal Fluid Pressure," by R. T. Stewart, and "Speed Regulation in Hydro-electric Plants," by Wm. F. Uhl.

The last professional session will be held on Friday morning when the following papers will be read: "The Present State of Development of Large Steam Turbines," by A. G. Christie; "A Discussion of Certain Thermal Properties of Steam," by G. A. Goodenough; "The Reduction in Temperature of Condensing Water Reservoirs Due to Cooling Effect of Air and Evaporation," by W. B. Ruggles, and "Results of Tests on the Discharge Capacity of Safety Valves," by F. E. Miller and A. B. Carhart.

On Thursday afternoon the visitors will be taken on a lake ride and in the evening a reception and dance will be given at the Colonial Club. On Friday the plants of the Goodrich Rubber Co. and the Wellman-Seaver-Morgan Co., at Akron, and the Diamond Match Co. at Barberton, O., will be visited.

The executive committee in charge of the Cleveland meeting, which is composed of the chairmen of various sub-committees, follows: Ambrose Swasey, chairman; R. H. Fernald, vice chairman; R. B. Sheridan, treasurer; F. W. Ballard, secretary; S. T. Wellman, E. P. Roberts, Worcester R. Warner, G. E. Merryweather, and A. G. McKee.

Will of Milton P. Higgins.—According to the will of Milton P. Higgins, late president of the Norton Co. and Norton Grinding Co., Worcester, Mass., his widow, Katharine C. Higgins, is named sole executrix, being left the entire estate. Mrs. Higgins will make several bequests arranged for by Mr. Higgins before his death. These bequests, which reach a total of $76,000, include $25,000 to the Washburn shops of the Worcester Polytechnic Institute and the same amount to the Worcester Trade School.

SHIPPING SEASON OPENS

Ore Carriers Reach Lower Lake Ports—Mines Active.

The shipping season in the Lake Superior iron region has opened. Ore is being transported to the various ports from a large number of mines and the movement down the lakes has started. The first cargoes were forwarded from Escanaba, Lake Michigan. There is still considerable ice in Lake Superior and in the St. Mary's river, its outlet, however, and it is hardly likely that the shipments will attain large proportions until May is well advanced.

The first boat to arrive at a lower lake port loaded with ore this season was the John Reis, which docked at Toledo, April 25, bringing about 9,000 tons of ore from Escanaba. The boat is operated by the Reis Coal Co. The second boat to arrive was the Champlain, which reached Ashtabula, from Escanaba, with 7,951 tons of ore, at 5:30 a. m. April 26. The unloading was finished at 11.07 a. m. . The boat is operated by the Great Lakes Transportation Co.

Two more companies have been incorporated under the laws of Ohio, in accordance with the policy of the Interstate Commerce Commission, which prohibits shippers from being interested in dock companies. The new companies are the Erie Dock Co., which will succeed the N. Y., P. & O. Dock Co., which for years has handled the ore of the Erie railroad, and the Ashtabula & Buffalo Dock Co., which will take over the property of the Ashtabula Dock Co., and the West Shore Dock Co., at Buffalo.

It probably will be a few weeks before steam shovels are put in operation at the stock piles on the old ranges. All the ore that the early boats will be able to handle can easily be procured direct from the shafts. On the Marquette range, the Steel Corporation's crushing plant at Ishpeming has gone into commission, having been overhauled during the winter. All the hard ore from the company's several mines in the immediate district is sent to it. The plant is the largest on the range, and is capable of handling a considerably greater tonnage than it has yet been called upon to treat

In the Negaunee field of the Marquette range, the work of developing the Lucky Star property has been started. The tract is controlled by E. N. Breitung, of Marquette, with the Cleveland Cliffs Iron Co. holding a minority interest. The new mine will be the deepest yet opened in the Negaunee basin. The first level will be opened at a depth of 1,100 ft., at which point a drift 500 ft. in length will be run to the ore body. The property will not become a producer until next year.

M. A. Hanna & Co., of Cleveland, are planning the erection of a concentrating mill at the American mine, west of Ishpeming, this summer. Although most of the ores mined are of a high grade, there is a great deal of ore running in the neighborhood of 40 per cent, and it is the intention to treat this ore so that it will be marketable.

The Beaufort mining property, located close to the village of Michigamme, at the western end of the Marquette range, is to be given attention this summer, an option for a lease having been given by the owners, George Thoney and John McEncroe of Ishpeming. The Beaufort was operated actively many years ago. M. A. Hanna & Co. have a prospective mine of large proportions in Section 19, 43-32, adjoining the Bristol mine of Oglebay, Norton & Co. It is known as the Ravenna mine.

The report that the Great Northern railway has secured a large portion of the lake front between Port Arthur and Ft. William, Ont., at the Canadian head of the lakes, has revived a report that coal docks and blast furnaces will be built there.

Owing to the disinclination of the management to sell ore at the present prices, only two shifts are now employed at the Mary Charlotte mine, Negaunee, Mich.

Three properties have been discovered on the Vermillion range during the past three months. They are the Consolidated Vermillion, Lucky Boy and Fargo. The Fargo is near the Section 30 mine and is owned by the Silverman estate, which was recently taken over by H. D. Fargo, of the Wells-Fargo Express Co.

The Grace mine of the Inland Steel Co., near Hibbing, Minn., has been pumped out and will ship this year.

Considerable pit ore has been stockpiled at the Leonard mine and it is planned to ship 2,000,000 tons this season. The mine is operated by the Oliver Iron Mining Co., and is one of the mines held by the United States Steel Corporation under the Hill lease.

Russellville, Ky., has under consideration plans for an improvement to its water plant, largely by putting down additional mains. A bond issue of $30,000 is under consideration.

COMPLAINTS ARE FILED

Against Railroads by Pig Iron and Coke Producers.

Complaints against railroad rates have been filed recently with the Interstate Commerce Commission by the Sloss-Sheffield Steel & Iron Co., of Birmingham, Ala., the Woodward Iron Co., of Woodward, Ala., and the Coke Producers' Association of the Connellsville region of Pennsylvania, representing the independent coke producers.

The Sloss-Sheffield company and the Woodward company have directed their attack against the Louisville & Nashville, Illinois Central, Alabama Great Southern, Seaboard Air Line, Atlantic, Birmingham & Atlantic and Mobile & Ohio railroads. They charge that the rates for transporting pig iron from producing districts in Tennessee and Alabama to Ohio and Mississippi river crossings and beyond, and to eastern cities and New England points are unjust and discriminatory. The complainants justify their claims on the ground that, although pig iron has persistently declined since 1907 until it has now reached $10 a ton at Birmingham, or $13.25 at Cincinnati, no corresponding change has been made in the rates, which remain the same as when the price of iron had reached its highest point.

The Coke Producers' Association aims its charges against the B. & O., Pennsylvania, P. & L. E., Pennsylvania Co., Pittsburgh, Ft. Wayne & Chicago; Pittsburgh, Cincinnati, Chicago & St. Louis; L. S. & M. S., Pittsburgh, Virginia & Charleston, Monongahela and Erie railroads. It is claimed coke rates to the west for other than blast furnace purposes are excessive, and in violation of the commercial law and discriminatory when compared with other rates for similar service on other lines serving competitive fields.

The address on "How Far Must Business Yield to the Demands of Industrial Combinations", by Hon. Joseph J. Feely, Boston, which appeared on page 905 of the April 25 issue of THE IRON TRADE REVIEW, was delivered at the convention of the National Metal Trades Association, in New York, April 11. The note stating this fact was inadvertently omitted.

The Calumet & Hecla Mining Co., and all subsidiaries, announced increased wages of 10 per cent, effective May 1.

EXCLUSIVE USE

Of Dock Property Not to be Permitted by Commission.

Washington, April 30.—One of the most important and far-reaching decisions that has been handed down by the Interstate Commerce Commission will be rendered in the near future. In effect, it will prevent the railroads owning docks from leasing them for the exclusive use of any shipper, thus throwing them open to competition and placing all shippers on the same basis. The railroads must operate their own docks directly or through agents who are not shippers.

This decision will not affect the docks owned by the United States Steel Corporation and other industrial concerns. But in the future, after the commission has acted, the railroads will be unable to give the advantage to one shipper over another by allowing him the exclusive use of a dock and denying it to his competitors.

This important question has been under consideration by the commission for some time and there was much doubt as to the authority to bring about such a result, and how it would be accomplished.

The solution was reached in the following manner: After making a thorough investigation of the question, the commissioners reached the decision that while they had no authority to order the railroad companies to operate their own docks, they could accomplish this result by placing the question on broad grounds and hold that docks owned by railroads were as much a part of a public utility as the railroad equipment, and to lease such docks for the exclusive use of one company was an unjust and illegal discrimination against other shippers, which the commission has the power to stop. This body, under the law, according to the conclusion reached, has the right to prevent all discriminations. Having arrived at this point, it was an easy matter for the commissioners to see their way to decide that an order directing railroads owning docks to cease and desist from the discriminatory practices of denying the use of part of its equipment to some shippers would force the roads to operate their own docks and deprive some of the companies (industrial) of the advantage they now have over their competitors.

The commissioners also had under consideration the question as to whether it has any authority over the docks owned by the United States Steel Corporation. It was the conclusion that the commission is powerless to take any action whatever that will take from the Corporation the advantages over the independents which accrue as the result of the ownership of its own docks.

Arthur Cooper Will be Inducted

At the annual meeting of the Iron and Steel Institute, to be held in London on May 9 and 10, the retiring president, the Duke of Devonshire, will induct into the chair the president-elect, Arthur Cooper. The papers to be read are as follows:

"Notes on the Solubility of Cementite in Hardenite," by Dr. J. O. Arnold and L. Aitchison, Sheffield.

"On the Chemical and Mechanical Relations of Iron, Vanadium and Carbon," by Dr. J. O. Arnold, Sheffield, and Prof. A. A. Read, Cardiff.

"Notes on a Bloom of Roman Iron from Corstopitum, Corbridge," by Sir Hugh Bell, Bart, Middlesbrough.

"The Influence of Carbon on Corrosion," by C. Chappell, Sheffield.

"The Manufacture and Treatment of Steel for Guns," by General L. Cubillo, Walladolid, Spain.

"The Corrosion of Nickel, Chromium, and Nickel-Chromium Steels," by Dr. J. N. Friend, J. Lloyd Bentley and W. West, Darlington.

"On the Mechanism of Corrosion," by Dr. J. N. Friend, W. West and J. Lloyd Bentley, Darlington.

"Sinhalese Iron and Steel of Ancient Origin," by Sir Robert A. Hadfield, F. R. S., Sheffield.

"Modern Rolling-Mill Practice," by J. W. Hall, Birmingham.

"The Influence of Heat on Hardened Tool Steels," by E. G. Herbert, Manchester.

"Improvements in Electric Steel Furnaces and their Application in the Manufacture of Steel," by Dr. H. Nathusius, Friedenshutte, Upper Silesia.

"A New Process for the Investigation of Fractured Surfaces of Steel," by F. Rogers, Sheffield.

"The Welding Up of Blowholes and Cavities in Steel Ingots," by Dr. J. E. Stead, F. R. S., Middlesbrough.

"Notes on Some Remains of Early Iron Manufacture in Staffordshire," by Prof. T. Turner, Birmingham.

The Bessemer gold medal for 1912 will be presented to J. H. Darby.

Annual Election of Dixon Crucible Co.

At the annual meeting of the Joseph Dixon Crucible Co., held recently at the main offices at Jersey City, N. J., the retiring board of directors was unanimously re-elected as follows: George T. Smith, William Murray, Edward L. Young, William H. Corbin, George E. Long, William G. Bumsted and Harry Bailey. These officers were elected for the ensuing year: President, George T. Smith; vice president, W. H. Corbin; treasurer, George E. Long; secretary, Harry Bailey; assistant treasurer and assistant secretary, J. H. Schermerhorn. Out of a total of 10,000 shares of stock, 9,304 shares were voted. The stockholders expressed themselves as well pleased with the company's showing and with future prospects.

ROLL FOUNDRY

Will be Erected on Addition to Hubbard Steel Foundry Co.'s Plant.

The Hubbard Steel Foundry Co. will erect a large addition to its plant at East Chicago, Ind., which will be devoted exclusively to the manufacture of sand and chill rolls, as well as other rolling mill equipment. This will be the first roll foundry in the west with the exception of the shop operated by the United States Steel Corporation in the Chicago district. The addition to the Hubbard plant will be 160 x 165 feet. The shop will be laid out in three sections, the middle bay being 75 feet wide with a crane runway extending its entire length. The height of the runway to the top of the rails will be 30 feet and this middle section will be served by a 40-ton crane. In the north bay, which will be 30 feet wide, two 20-ton air furnaces of the Swindell type will be installed. The south bay will be 60 feet wide and will be served by a 10-ton crane. The scrap yard, which will parallel the furnace bay, will be 59 feet wide and will be served by a 10-ton gantry crane.

A machine shop, 75 x 120 feet, also will be erected and all of the machine tool equipment installed in the present plant will be moved into the new shop and a large number of new tools also will be purchased. The Hubbard Steel Foundry Co. is in the market for five roll lathes, an 8-foot vertical boring mill, a 5-foot horizontal spindle mill, an 8-foot planer, a gear planer capable of turning out spur gears up to 20 feet in diameter and bevel gears up to 14 feet in diameter, as well as a complete list of smaller tools, including lathes, drilling machines, planers, etc. Another 150-kilowatt generating set will be added to the power plant equipment.

The new buildings will be of steel construction throughout, equipped with metal sash, and every effort will be made to place the new departments in operation no later than July 1. Chas. J. Mesta, manager of the Hubbard Steel Foundry Co., has had a wide experience in the manufacture of all kinds of rolling mill equipment.

J. F. Buchanan, 28 Rowntree street, Balmain, Sydney, N. S. W., superintendent of Taylor's Paragon Foundry, would like to obtain catalogs and price lists of all kinds of foundry equipment from American manufacturers.

The plant of the Ironton Malleable Co., Ironton, O., will be sold. It has been in operation two years.

BRITISH IRON TRADE

Difficulty Met in Getting Works Again Under Way.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., April 20.

Pig Iron.—The trade is slowly recovering from the coal strike, but the effects continue very severe, and, most of all, in the raw material department. There has been a steady rise in the price of pig iron during this week, so that producers of No. 3 iron have realized 54s 6d ($13.34) per ton for delivery this month. Since the beginning of the strike, there has been an advance of 4s 6d in Cleveland pig iron and 4s in east coast hematite. Hardly any furnaces have recommenced, and in the Cleveland district it is unlikely that normal conditions in regard to output will be reached before May. Present quotations are higher than for the past four years. The stocks in Cleveland have been very rapidly reduced, the amount now in store being 415,000 tons. Shipments are still heavy, though not so large as in March. Stocks have decreased this month by nearly 50,000 tons, a reduction since the autumn of 180,000 tons. In the Barrow district, there is, at present, only one furnace in blast; but it is hoped that others will be started next week, and inquiries are rapidly increasing. Great difficulties have been experienced in getting fuel, in consequence of the railway congestion, and foundries are being a good deal inconvenienced in this way. There is a good deal of inquiry as to whether it is possible to obtain American pig iron.

Finished Iron and Steel.—There is a decided tendency to inflation in the iron and steel trade. The most important change was an advance in marked bars, declared on Thursday at the quarterly meeting, when the price was officially declared to be £9, representing an advance of 10s per ton. This is the first time since 1906 that £9 has been reached, and higher figures still are consequently expected. In regard to steel, joists were, on Thursday, raised 5s, making the selling price £7. This was done to bring this material in line with the section advance of a week earlier. There is hardly any foreign competition in any branch of the trade. Steel billets are almost impossible to get, and the minimum is now £5 10s, but very commonly the quotation is £5 12s 6d for Bessemer billets. A few Belgian billets were on offer at £5 6s 3d, which is 1s 6d above the quotation of a week ago. The demand for galvanized sheets has rapidly improved, the minimum now being £12 up to £12 10s, and works are full of orders. The Welsh trade is practically stopped for want of raw steel, which cannot now be got. A further premium has been added to puddled bars, which sell at £5 17s 6d to £6.

SIXTH CONGRESS

Of the International Association For Testing Materials.

Announcement of the tentative program has been made by the committee in charge of the sixth congress of the International Association for Testing Materials, which will be held in New York in the Engineering Societies building, Sept. 2 to 7. On Monday, Sept. 2, the headquarters will be opened for the registration of members and on Tuesday morning the congress will convene at 10 o'clock. Addresses of welcome will be delivered by acting president of the international association, Dr. Henry M. Howe, and by national, state and municipal officials. The various sections will then arrange for their sessions which will convene at 2 p. m. On Wednesday, section sessions will take place from 10 to 12 a. m., while the afternoon and evening will be occupied by an excursion to West Point. On Thursday sessions will begin at 10 a. m. and 2 p. m., and in the evening a reception will be tendered by the American Society of Civil Engineers in its building at 220 West Fifty-seventh street. Section sessions will be held in the morning and afternoon on Friday, and in the evening there will be an excursion down the harbor. The congress will adjourn at noon on Saturday, a general session having been arranged which will be called at 10 o'clock on that day.

For those who desire to visit the eastern section of the United States, a special excursion in a hotel train will be arranged. This train will leave in two sections, one on Saturday night, going to Atlantic City, where Sunday will be spent, and the other on Sunday afternoon for those who prefer to spend more time in New York City. These sections will reach Washington together on Monday morning, where a sufficient stay will be made to visit the government buildings. From Washington the party will go to Pittsburgh and from that city the excursion will continue to Buffalo and Niagara Falls. On the return trip stops will be made at different plants, including that of the Bethlehem Steel Co. at South Bethlehem, Pa. The excursion train will return to New York City in time for foreign visitors to take the steamers sailing on Saturday, Sept. 14, if they so desire. The cost of the excursion is $50.

TRUMBULL STEEL CO. PLANS

To Erect Large Mill at Warren, O., For Manufacture of Tin Plate.

Capitalized at $1,000,000, the Trumbull Steel Co. has been incorporated and will erect and operate a tin plate mill at Warren, O. It will have an annual capacity of 35,000 tons and will be built on a site of 57 acres, comprising the bulk of what is known as the Younger farm on the River road between Warren and Niles, O. It is proposed to make it the largest exclusive tin plate mill in the Mahoning valley, and to have it completed by next spring. Later, the company contemplates the production of light plates. The incorporators are Jonathan Warner, Youngstown, O.; W. T. Hardesty and W. H. B. Ward, Niles, O., and John T. Harrington and D. W. Kerr. The officers will be: President, Jonathan Warner; vice president, W. T. Hardesty; treasurer, W. H. B. Ward; office manager, Warren Kerr. Mr. Warner formerly controlled the Empire Iron & Steel Co., which he sold to the late Col. George D. Wick. He is well known as a sheet mill authority. Ward and Hardesty were associated with him in managing the Empire mills.

A New Terne Plate Base

Copper-bearing open-hearth steel is now being used exclusively in the manufacture of all its terne plate for roofing purposes by the American Sheet & Tin Plate Co., Pittsburgh. A large number of tests, made of these plates in different parts of the country and under varying conditions, conclusively prove that this product will meet the demand for strictly high-grade roofing tin. The principal point of superiority indicated by these tests is a more perfect union of the black plate with the tin and lead coating, which results in a sheet remarkably free from small imperfections. A serious objection raised by tinners against terne plate is that the material is too hard and stiff to work easily. It is claimed that this difficulty also has been overcome in the steel containing the proper proportion of copper which is very soft and ductile. The use of high grade plate for roofing purposes always has been advocated by the American Sheet & Tin Plate Co., as it is contended that the longer service justifies the increased first cost. Several years ago this company inaugurated the policy of stamping the weight of coating distinctly on each sheet of terne plate, thus making impossible the substitution of plates carrying less coating than called for.

NEAR RECORD

Were Exports for March—Pig Iron and Ore Imports Increase.

March iron and steel exports showed a gain of 14,000 tons over exports in February and of 67,000 tons over January. The March exports were the largest for a month in our history with the exception of April, 1911, when exports were particularly heavy in order to anticipate the new Japanese tariff.

The value of all iron and steel exports, including the tonnage items as well as hardware, cutlery, machinery, etc., was the largest for any month with the exception of April, 1911, and fell short of the total for that month by only half a million dollars. The figures by months since the beginning of 1908 are shown in the table on this page.

IRON AND STEEL EXPORTS, GROSS TONS.

	March,		Nine months ending March,	
	1911.	1912.	1911.	1912.
Scrap	10,496	6,915	33,359	57,107
Pig iron	15,189	19,689	126,602	100,805
Billets, sheet bars, etc.	32.898	23,782	118,781	150,410
Wire rods	2,225	7,870	13,154	29,074
Rails	42,520	27.332	268,075	273,033
Steel bars	11,746	15,495	90.865	98,365
Iron bars	3,141	702	13,697	10,366
Structural	16,374	19,911	118,455	174,158
Hoop, band and scroll	*	743	*	5.565
Sh'ts and plates	33,956	39,646	214.396	315,963
Tin plate	5,532	6,397	16,362	51,204
Barb wire	6,887	6,789	60,702	77,759
All other wire	11,882	11,401	75,307	95.606
Cut nails	1,306	825	7,678	7,971
Wire nails	7,001	2,964	37,350	42,359
All other, including tacks	790	1,181	8,385	9.576
Pipes and fittings	17,200	26.667	126,745	159,324
Cast radiators, etc.	217	384	2,901	3,362
Totals	216,360	218,690	1,332,814	1,662,037

*Not separately stated prior to July 1, 1911.

IRON AND STEEL IMPORTS, GROSS TONS.

	March,		Nine months ending March,	
	1911.	1912.	1911.	1912.
Scrap	1,923	650	20,004	8,431
Pig Iron	11,578	10,154	159,092	88,237
Blooms, billets and steel n. e. s.	5.041	1,502	32,514	17,611
Wire rods	1,301	1,040	13,978	10,522
Rails	*	328	*	2,621
Bar iron	2,298	1,150	24,048	17,260
Structural	*	416	*	2,461
Sheets and plates	235	120	3,042	1,735
Tin plates	1,157	106	38,128	2,562
Totals	23,533	15,466	290.806	151,440

*Not separately stated prior to July 1, 1911.

As the tonnage total for March, 1912, was only a trifle above that for March, 1911, it is interesting to observe the changes which occurred in the different items from one year to the next. Scrap decreased nearly 4,000 tons, while pig iron increased about as much. Billets, sheet bars, etc., decreased 9,000 tons, but rods increased 5,000 tons. Rails decreased 15,000 tons. These changes in the cruder forms of material, involving a net loss, were balanced by increases in more finished products. Bars, structural material, sheets and plates and pipes and fittings scored large increases. There was, however, a decrease in wire nails, from 7,001 tons in March, 1911, to 2,964 tons in March, 1912. This, however, was only a temporary variation, for the total in the nine months ending March showed an increase from 1911 to 1912.

IMPORTS BY MONTHS.

	1910.	1911.	1912.
January	56,207	33,071	20,008
February	43.613	20,812	11,622
March	54,176	23,533	15,466
April	47,698	22,392	.....
May	42,569	23,376	.....
June	33,322	29,395	.....
July	41,933	15,782	.....
August	36,879	19,943	.....
September	30.961	14,039	.....
October	31,455	21,035	.....
November	40,585	13,878	.....
December	31,575	19,665	.....
Totals	487.973	256,903	47,096

Imports showed an increase from February to March, the increase being due to pig iron (including ferro manganese, spiegeleisen, ferro-silicon, etc.) these imports having been as follows: January, 13,085; February, 5,553; March, 10,154.

IRON ORE IMPORTS BY COUNTRIES.

	March, 1912.	Nine months.
Spain	26,141	154,686
Sweden	40,561	184,226
Canada	.....	29,778
Newfoundland and Labrador	.....	140,443
Cuba	90,665	923,759
Other countries	102	18,252
Totals	157,469	1,451,144

Since our tin plate imports dropped to negligible figures, our imports outside of pig iron, etc., are very light. The total iron and steel imports by months since the beginning of 1910 are shown in the accompanying table.

Ore Imports Larger

Iron ore imports showed an increase in March over both January and February, the imports being larger than in any month since October, and much larger than those in March a year ago. The imports by months since the beginning of 1909 are shown in the following table, while the details as to sources of the imports are also shown for March, 1912, and the nine-month period ending with the month.

IRON ORE IMPORTS, BY MONTHS.

	1909.	1910.	1911.	1912.
January	105,233	284,823	102,600	154,118
February	61,749	170,427	94,820	129.693
March	108,676	163,633	134,785	157,469
April	74,782	206,135	133,903	.....
May	97,393	240,833	217,467	.....
June	124,714	193,415	118.296	.....
July	172,316	248,810	200,845	.....
August	209,855	282,949	175,183	.....
September.	164,613	208,892	184,456	.....
October	178,051	219,571	172,459	.....
November	174,966	197.833	128,019	.....
December	222,609	173,710	148,902	.....
Totals	1,694,957	2,591,031	1,811,732	441,280

Old Defenses Set Aside

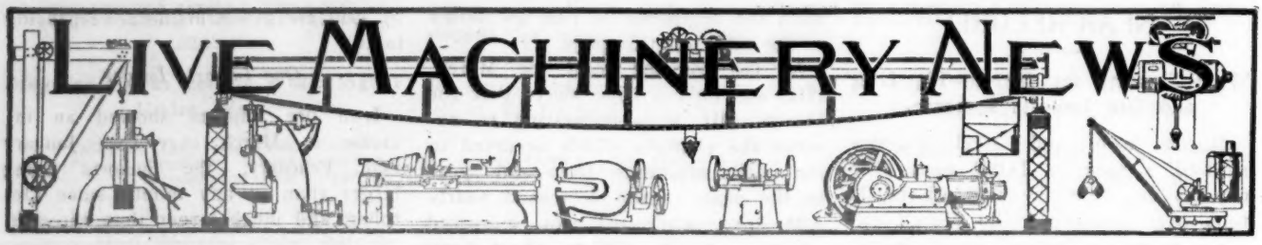
An interesting case involving employers' liability has recently been decided by the supreme court of Illinois. The case is known as Streator versus The Western Wheel Scraper Co. The supreme court reversed the decision of the lower courts, which had decided in favor of the corporation. Walter Streator, a mechanic in the works of the scraper company at Aurora, sued to collect damages for the loss of three fingers suffered while he was operating a joiner. Circuit Court Judge Carnes instructed the jury to bring a verdict for the defendant, alleging that Streator was not entitled to damages, as he had taken all of the risks. The case was next brought to the appellate court and the decision of the lower court was sustained. The supreme court, however, reversed the preceding decisions, contending that the complainant had not taken the risks. This decision is said to set aside all the common law defenses in Illinois, including "the assumption of risk".

VALUE OF IRON AND STEEL EXPORTS—TONNAGE AND NON-TONNAGE.

	1908.	1909.	1910.	1911.	1912.
January	$ 13,468,058	$ 13,329,388	$ 14,513,394	$ 18.739,961	$ 18,451,914
February	14,063,559	10,947,159	13,949,082	18,690,792	21,801,570
March	15,168,155	13,874,461	17,258,503	22,591,991	24,474,799
April	15,455,319	13,058,054	16,529,254	24,917,056	.....
May	11,281,415	12,993,197	17,658,042	20.616,795	.....
June	11,677,944	13,779,736	16,503,204	20,310,053	.....
July	12,085,951	11,866,772	16,108,102	18.052,337	.....
August	12,058,561	14,136,219	17,628,538	20,704,154	.....
September	11,221,799	12,966,908	16,776,178	20.534,139	.....
October	11,535,063	14,249,598	17,452,085	20,799,591	.....
November	10,895,549	14,434,600	18,593,806	21.547,379	.....
December	12,231,741	15,075,183	18,300,710	22,186.996	.....
Totals	$151,113,114	$147,680,331	$201,271,903	$249.656,411	$64,728,283

EXPORTS OF TONNAGE LINES—GROSS TONS.

	1908.	1909.	1910.	1911.	1912.
January	74,353	70,089	118,652	152,360	151,208
February	81,773	84,860	110,224	150,919	204,972
March	96,681	94,522	124,980	216,360	218 690
April	93,285	100.904	117,921	228,114	.....
May	64,341	109,977	135,306	178,428	.....
June	69,770	114,724	120,601	174,248	.....
July	86,796	100,680	128,216	162,929	.....
August	86.244	135,694	131,391	177,930	.....
September	76,732	97,392	119,155	181,086	.....
October	85,766	110,821	129,828	186,234	.....
November	71,130	115,943	155,138	187.541	.....
December	77,659	137,688	150,102	190,938	.....
Totals	964,242	1,243,467	1,537,943	2,187,809	574,870



In New York, the Wabash railroad has purchased about $25,000 worth of machine tools and the Morgan Steamship Line about $10,000 worth of shop equipment during the past week or two. In addition, a number of manufacturing interests placed a large total of orders for both machine tools and power equipment. It is expected that some important lists of shop equipment specifications will be issued by railroads in the near future in the New York market. In Pittsburgh, inquiries are out for a large volume of business, but manufacturers still complain of the prevailing low prices. In Cleveland, the demand for power plant equipment is improving, but the market as a whole is still rather quiet. In Chicago and other western cities, the machine tool business shows expansion, but the bulk of the business is in small lots. A good demand for boilers, pumps and elevator equipment, in connection with numerous large new buildings, is reported from Chicago.

Water Works

The Moulton Irrigated Lands Co., Colusa, Cal., will install new motors, pumps and transformers for raising water for irrigation purposes.

The city of Grafton, W. Va., has approved a bond issue of $90,000, for extending and improving its water works system.

L. E. Well, city clerk of Shelbyville, Ind., is asking for bids until May 7, for the construction of a pumping station and the installation of machinery therein.

The Midland Engineering & Construction Co., Fort Scott, Kas., has been engaged to prepare plans and supervise the construction of a water works to cost $30,000 at Moran, Kas.

Bonds in the amount of $82,500 have been voted by the city of Modesto, Cal., and an up-to-date municipal water system will be installed in the fall. F. C. Roberts, San Francisco, is engineer in charge of the work.

Machine Tools

The Morgan Steamship Line has bought approximately $10,000 worth of shop equipment in the New York market during the past 10 days.

Orders for machine tools amounting to about $25,000 have been distributed among New York houses, by the Wabash Railroad Co. The machines are intended for a number of the company's shops.

B. V. Brown, Louisville, Ky., and H. E. Beck, Bowling Green, Ky., are to establish an industrial school at Elizabethtown, Ky. Woodworking and forging departments will be included in the school.

A machine shop for automobile repairing will be equipped in the near future by the Louisville Lozier Co., Louisville, which has been formed there. Howard Lothrop is head of the company, which has temporary quarters at 708 West Broadway.

The J. W. Wells Lumber Co., Marinette, Wis., and Menominee, Mich., is establishing a complete machine shop at its main camps on the Peshtigo river in Wisconsin. Part of the equipment is being taken from the shops of the Bird & Wells Lumber Co., the saw mills of which were recently dismantled. Some little equipment will be purchased in addition. A. W. Gray is superintendent.

Power Plant Equipment

Purcell, Okla., has voted $100,000 worth of bonds for the erection of a light and water plant.

The village board of Mahomet, Ill., has granted F. E. Wright a 20-year franchise to construct and operate an electric light plant.

Mayor Alexander of Los Angeles, is the head of a municipal board, which will formulate plans for a $5,000,000 power system.

The McCray Refrigerator Co., Kendallville, Ind., contemplates the erection of a power plant, which will have a capacity of about 350 horsepower.

The Tri-City Railway & Light Co., Davenport, Ia., will expend about $100,000 in improvements and is in the market for a large motor generator set.

The Feather River Power & Irrigation Co., Oroville, Cal., will build a large hydro-electric power plant in Feather River Canyon. W. P. Hammon heads the board of directors.

The Beardstown Electric Light & Power Co., Beardstown, Ill., is reported to be planning extensive improvements and enlargements to its plant.

John W. Frye, Centreville, Tenn., is interested in the construction of a hydro-electric plant near that city. The current will be used for the operation of phosphate mines, it is expected.

The Ford Motor Co., Detroit, is figuring on some 500-kilowatt, low pressure, turbo-generators and some condensing equipment. The contracts are expected to be let in three or four weeks.

The county commissioners, Milwaukee, have employed Eugene McAleer, consulting engineer, Chicago, to estimate the cost of establishing a central light and power plant for the county buildings at Wauwatosa.

E. J. Peters, of Minneapolis, and John J. Geiger, Fargo, N. D., are interested in the construction of a hydro-electric power plant on the Canon river in Minnesota, to supply electricity to Red Wing and Rochester, Minn.

The city council, Luverne, Minn., contemplates the installation of additional electrical equipment in the municipal electric light plant to cost $6,000. C. N. Philbrick is superintendent.

The Altoona & Logan Valley Electric Railway Co. has completed plans for a brick, concrete and steel shop addition to its plant at Altoona, Pa., and will require some equipment in the near future.

The Twin City Rapid Transit Co., Minneapolis, Horace Lowry, general manager, is considering the installation of a new sub-station in Minneapolis to cost $10,000. Motor generator equipment will be required.

Anderson & Spilman, Danville, Ky., who are constructing a grain elevator with a capacity of 25,000 bushels, will require power and conveying equipment. The contract for the building has been let to A. W. Falker.

The Central Coal & Coke Co., Keith building, Kansas City, Mo., is receiving bids for boilers, aggregating 1,400 horsepower, to be used in supplying

steam for its various mines near Rock Springs, Wyo.

The Mill Valley & Mount Tamalpais Railway Co., with headquarters at Mill Valley, Cal., is planning to electrolize its system and will soon announce specifications for bids for power plants and transmission line.

The Chippewa Valley Railway, Light & Power Co., Eau Claire, Wis., will award contracts soon for a new substation, 50 x 60 feet, which will be equipped with motor generator sets, switch-boards, etc.

The Atlas Coal Co., Burgettstown, Pa, is taking bids on the construction of a power house and adjoining structures, also for piping and steam equipment. Smith & Lewis, Oliver building, Pittsburgh, are the engineers.

Estimates are being asked by Frank Porter, engineer at the Fort Pitt hotel, Pittsburgh, for additional power equipment for the enlargement of the hotel. It includes three gas engines, generators, switchboards, etc.

The Ozark Water & Power Co., St. Louis, which has placed contracts for its first hydro-electric plant on the White river, plans to develop two other power sites of 15,000-horsepower each, within two years.

Plans have been almost finished for the new power-house of the Louisville Railway Co., Louisville, Ky., which will be built at Twenty-eighth and High streets. F. H. Miller is superintendent of motive power.

Plans are being worked out by the New Jersey state board for improvements at the sanitorium for tuberculosis patients, at Glen Gardner, N. J. The contemplated improvements include a power and heating plant. About $90,000 will be spent.

The Colorado & Southern Railway Co., Denver, Colo., is in the market for three 500-horsepower and four 350-horsepower, water tube boilers to be equipped with super-heaters, mechanical draft fans and chain grate stokers. W. C. Weldon, Cooper building, Denver, is purchasing agent.

D. Y. Johnson, Nashville, Tenn., has leased a mill site at Brown's Lock, on the Barren river, in Kentucky, and will erect a water power plant there. The chief use of the current will be in the operation of stone quarries in the Bowling Green district.

The Interstate Power Co. has been incorporated at Louisville, with $500,000 capital stock. The plans of the company have not been outlined, except that it will develop a water power project at some point in Eastern Tennessee. The incorporators are J. C. Loomis, T. K. Helm and R. J. Snyder.

The Dix River Power Co, of which L. B. Herrington, Richmond, Ky., is president, will begin work on its hydro-electric plant in Mercer county, Ky., in the near future. Its formal articles of incorporation indicate a capital stock of $50,000, but the amount to be expended is said to approximate $3,000,000.

The Mound City Electric Light & Power Co., Mound City, Ill., operating a water and light plant, has been purchased by the McKinley Traction Co., which will expend about $35,000 in improvements. C. W. Humphrey, 209 South La Salle street, Chicago, is engineer in charge of the improvements.

The Northwestern Electric Co. has applied to the Portland, Ore., city council for a franchise to supply electric light and power. The company has announced that it has from $5,000,000 to $20,000,000 to invest in a new system, and that if given the franchise it will install a complete system and erect power houses. The directorate of the company includes Mortimer and Herbert Fleishacker, William H. Crocker and Antone Borel, San Francisco.

A number of buildings are about to be erected in Chicago, which will require a large amount of elevator machinery, pumps, boilers, etc. A. S. Altschuler, architect, Fort Dearborn building, Chicago, is understood to have prepared plans for a 16-story office building on Dearborn and Monroe streets and J. L. Kenner will erect a 21-story office building on State and Quincy streets. Considerable machinery will also be required for the new Rothschild building, on State and Van Buren streets.

New Construction

It is understood the Standard Chain Co., Marion, Ind., will expend $50,000 this year in enlarging its factory.

The Galena Iron Works, Galena, Ill., is building a mill at the Lawrence mine in Wisconsin.

An addition, 100 x 300 feet, will be made to the new plant of the Victor Safe & Lock Co., Norwood, O.

The R. L. Barnes Safe & Lock Co., Richmond, Va., whose plant was recently destroyed by fire, is unable at this time to give out any definite statement regarding rebuilding plans.

The Allyn Engineering Co., Cincinnati, will superintend the construction of the new plant of the Knabe Bros. Piano Co., at Norwood, O., to replace the one recently destroyed by fire.

The plant of the Allentown Rolling Mills, Allentown, Pa., was damaged by fire to the extent of about $100,000 on April 23. The machine shop was destroyed.

The Montour Steel Co., Montour Falls, N. Y., has made plans to add a building, 112 feet in length, to its plant. Modern structural machinery will be installed in the addition.

J. C. Llewellyn, 38 South Dearborn street, Chicago, is planning a four-story foundry and pattern shop for the Union Steam Pump Co., Battle Creek, Mich., to cost $50,000.

The International Smelting & Refining Co., New York, is making some extensive additions to its plant at East Chicago, Ind. About $350,000 will be expended.

The Allyn Engineering Co., Cincinnati, has charge of the building of a large addition to the plant of the Lauth-Juergens Motor Car Co., at Freemont, O.

The Racine Mfg. Co., Racine, Wis., advises that it contemplates the erection of two large additions to its plant but plans and specifications are not yet ready. The concern manufactures automobile bodies, etc.

The United Engineering & Foundry Co., Pittsburgh, has the general contract for the mill equipment for the Apollo Sheet Steel Co.'s plant at Apollo, Pa., which calls for a total of six mills.

The Iron-Clad Mantle Co., Sebring, O., is completing a factory at Canton, O., at a cost of $8,000, the buildings being two stories, of brick, 36 x 135 feet. The company is represented by J. H. Kayser, of Canton.

The Pennsylvania Galvanizing Co. is having the old building at the southeast corner of Twenty-second and Race streets, Pittsburgh, torn down and will build a new plant, 132 x 141 feet, upon the site.

Nine acres in Hertel avenue, near the Erie railroad, Buffalo, have been acquired by the Strong Steel Foundry Co. Part of the site will be occupied by the company's plant. Several of the buildings have been started.

The International Hoist Co., Antigo, Wis., will start work immediately on the erection of two new buildings. There will be a machine shop, 40 x 80 feet, and a foundry, 60 x 90 feet.

The Automatic Sprinkler Co. of America has announced that it will locate a plant at Youngstown, O., and consolidate the company's works at Akron, O., Philadelphia and Syracuse, N. Y.

The Miami Cycle & Mfg. Co. will ask for bids about May 10, for two reinforced concrete fireproof factory buildings to be located at Middletown,

O. George Barkman, Hamilton, O., is the architect in charge.

The Allyn Engineering Co., Cincinnati, has been authorized to erect a plant for the American Well & Prospecting Co., which manufactures well drilling machinery, at Columbus, O., the company having recently moved to that place from Corsicana, Tex.

The Wisconsin Motor Mfg. Co., Forty-fourth avenue and Burnham street, West Allis, Milwaukee, is preparing plans for the erection of a large addition, which will increase the capacity by more than 50 per cent. Charles John is president of the company.

The National Cash Register Co., Dayton, O., in reference to a report that it would erect a new foundry, advises that nothing in this direction will be done until the city carries out its river straightening project, which will not be for several years.

Stockholders of the Pittsburgh Steel Foundry Co. have approved the increase in capital from $400,000 to $1,000,000, and have plans well under way for building an addition to the plant at Glassport, Pa., which will materially increase the capacity of these works.

Following the announcement that orders have been placed for the structural material for the large manufacturing plant to be constructed for the H. W. Johns-Manville Co., at Newark, N. J., it is expected that specifications for both special and standard machinery will appear soon.

The recently incorporated United Foundry & Machine Co., Bridgeport, Conn., is contemplating the establishment of a plant on Connecticut avenue, Bridgeport. Present plans include a foundry building, machine shop, and power plant, all to be constructed of reinforced concrete.

The Modesto Iron Works, Modesto, Cal., has purchased a tract at Modesto, and will construct a building, 100 x 140 feet, for the manufacture of farm implements. It is announced by officers of the company that considerable new machinery is to be purchased. E. Green is president.

Stockholders of the Warren Axe & Tool Co., Warren, Pa., have voted to increase the capital stock from $100,000 to $200,000. It is reported that the capacity of the plant will be greatly increased within a few years, although the company is not now contemplating any new buildings or additions.

The Croxton Motor Co., Cleveland, is considering plans for building a new plant at Washington, Pa., for the exclusive manufacture of taxicabs, and a site of six acres has been optioned, along the Baltimore & Ohio railroad. Plans for the building are being prepared. J. P. Stoltz, president of the Croxton Motor Co., was in Washington going over the plans last week.

The Continental Radiator & Foundry Co., manufacturer of boilers, radiators and heating specialties, will combine its two plants, one at St. Louis and the other at Edwardsville, Ill., in one, and locate in Ft. Madison, Ia. The company will employ between 50 and 75 skilled mechanics to begin with, and will install about $25,000 worth of machinery in the Ft. Madison plant.

William Zoller & Co., Pittsburgh, have awarded contracts for the construction of a boiler house and other extensions to their plant on the Northside to Walker & Curley, general contractors, and the steel work has been given to the Des Moines Bridge & Iron Co. The new building is to be 18 x 75 feet, and two stories high, of reinforced concrete construction.

The new plant of the Pease Foundry Co., to be erected in Brampton, Ont., will comprise 11 buidings, all one story except the office building, which will have two stories, giving an aggregate floor space of 137,000 square feet. The buildings include a foundry, warehouse, shipping room, blacksmith shop, machine shop, core room and ovens, rumbling room, pattern shop, pattern vault and dome and tin shop for the manufacture of furnace casings.

The Crawford Locomotive & Car Co., Streator, Ill., advising in regard to its recent increase in capital stock, announces that it is going to enlarge its business. The enlargement at present under contemplation is the construction of a forge and steel car shop. Bad weather has retarded the company in progressing with this work. Other improvements are being considered, but the company is not prepared at this time to give out details regarding them.

The Defiance Machine Works, Defiance, O., advises that it is building an erecting shop, 77 x 132 feet, and another shop, 97 x 115 feet, to be used for cleaning castings and to contain the shafting, plate and grinding and blacksmith departments. Both buildings are to be of saw-tooth roof construction. This company will not be in the market for any further machinery until these buildings are completed, at which time it will probably rearrange its machinery and add some new tools.

The Shirley Radiator & Foundry Co., which recently increased its capital stock from $100,000 to $250,000, advises that it will build its proposed new plant at Beech Grove, Indianapolis, Ind. The dimensions of the different departments follow: Foundry, 102 x 319 feet; core room, 63 x 96 feet; cleaning and testing room, 79 x 102 feet; machine shop and assembling room, 102 x 147 feet; metal pattern shop, 47 x 63 feet; warehouse, 127 x 127 feet; cupola room, 35 x 40 feet. The plant will get its power from local electrical companies.

The Germantown Tool Works, Philadelphia, whose plant was destroyed by fire in February, has instructed engineers to proceed with the designing of a complete new plant which will be located on a new site near Second street and Duncannon avenue. The new plant will include seven separate one-story buildings, ranging in size from 30 x 100 feet to 40 x 100 feet. The grouping and connection of the buildings will be arranged in such a manner that the process of manufacture will be carried forward continuously through the plant.

Miscellaneous

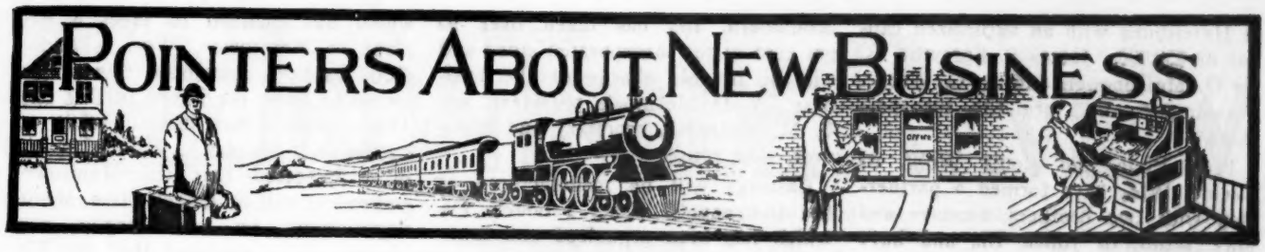
The Hanna Engineering Works, Chicago, advises that the addition which it is making to its plant will not require any new machinery or equipment.

James Scott, who is opening the Red Jacket No. 1 coal mine in Clearfield county, is preparing to open a new mine and develop the coal tract he holds under lease near Phillipsburg, Pa.

A large cement mill with a capacity of 2,000 barrels a day, is to be built near Pine Hill, Ky., by the Kentucky Portland Cement & Coal Co., organized in Baltimore, with $1,200,000 capital stock. Coal mines will also be operated. E. M. Newton, Baltimore, is president.

The G. W. Bradley's Sons Sales Co., Brooklyn, N. Y., manufacturer of axes and edge tools, advises that it has leased and is equipping quarters at 50 Seabring street, Brooklyn, from the Hamilton Terminal Co. The company is not in the market for any machinery, having already provided for its requirements.

A number of furniture and woodworking plants in Grand Rapids, Mich., are making extensions which will require considerable new equipment, including woodworking machinery. The Imperial Furniture Co., Grand Rapids, has awarded a general contract for the construction of a four-story and basement factory building to cost $100,000. The J. Von Wittenberg & Son Lumber Co. is building a two-story factory, 50 x 150 feet, to cost $25,000. Robinson & Campau, 449 Housman building, Grand Rapids, will soon ask for bids for a four-story woodworking plant, 110 x 160 feet, to cost $100,000.



New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

The Connecticut Turbine Mfg. Co., New London, Conn.; $75,000; by William L. Hopson, Thomas F. Foran and Chas. H. Klinck.

The Consolidated Gas Machine Co., Rochester, N. Y.; $75,000; to manufacture gas machinery; by M. D. Colbath, L. I. Willsea and T. W. Richardson.

The Belleville Copper Rolling Mills, Belleville, N. J.; $50,000; by H. W. Hendricks, E. J. Keans and G. A. Dorer, Belleville.

The Noye Bros. Co., Buffalo; $5,000; to repair and construct mill machinery; by Albert A. Noye, Richard K. Noye Jr., and Elizabeth M. Nauth.

Canton Metal Ceiling Co., Canton, O.; $200,000; by Clarence A. Welrich, Homer V. Briggle, Elmer S. Schweyer, Stuart L. Briggle, L. V. Carnahan.

Norfolk Wire Cloth Co., Baltimore; $1,000; by Joseph W. Bristor, United States Fidelity and Guaranty building; Paul R. Howard and Melvin E. Graham.

The United States Foundry & Mrchine Co., Bridgeport, Conn.; $200,000; by William C. Buckelew and Phillip Dumphrey Beach, Bridgeport, and Andrew Steen, New York City.

Salter-Disher Steel Co., Ltd., Toronto; capital, $300,000; to manufacture structural metals; provisional directors, Wm. H. Salter, Clark E. Disher and others.

The John Brown's Sons Co., Olean, N. Y.; $25,000; to manufacture cutlery and tools; by W. R. Brown, Tidioute, Pa.; J. W. Brown, Little Valley, N. Y.; R. E. Brown, Olean, N. Y.

Vixen Motor Co., Indianapolis; $12,000; manufacturers; by directors, F. C. Schmid, W. J. Harris, C. O. Van Horn, S. B. Lindley and D. K. Lindley.

Steel Post Co., Kent, O.; $100,000; to manufacture steel posts; by Joseph M. Raub, Ransom R. Spoor, Clyde C. Smith, E. C. Lewis, O. S. Rockwell, W. A. Bartshe.

The Xargil Kerosene Engine Co., Utica, N. Y.; $100,000; to manufacture motors, machinery and engines; by B. F. Gilbert, G. A. Frisbie and J. A. Xardell.

Indiana Electric Appliance Co., Ft. Wayne, Ind.; $25,000; manufacturers; by directors, W. L. Moellering, C. E. Prange, Arthur Lepper, Henry Klebe and C. F. Prange.

The Columbia Metal Stamping Co., Cleveland; $25,000; iron, steel, brass and metal dies and stampings; by Fred C. Koch, James C. Ertel, Harry C. Gahn, Frances Koch, Eleanor J. Ertel.

Sommerville Iron & Bronze Co., Pittsburgh; $32,000; by John R. Keers, Wilkinsburg, Francis Laird Snowden, Thomas Spence and Howard Zacharias, Pittsburgh; W. G. A. Miller, Bellevue.

Apollo Steel Co., Apollo, Pa.; $300,000; by A. M. Oppenheim, O. W. Oppenheim, W. J. Guthrie, Robert Locke, J. E. Gallagher, Charles P. Wolfe and J. H. Jackson, of Pittsburgh.

Marshall-Davis, Ltd., Dunnville, Ont.; capital, $50,000; to manufacture electrical and gas equipment; provisional directors, Vernon J. Davis, Thos. Marshall, Richard A. Harrison and W. D. Swayze.

The Angell Nail & Chaplet Co., Cleveland; $24,000; manufacturing and handling nails, chaplets, rivets, tacks, springs, etc.; by George W. Angell, J. Arthur Hambleton, Charles F. Homeier, C. A. Angell, Edward F. Kreckel.

Continental Foundry Corporation, Ft. Madison, Ia.; $250,000; to operate an iron foundry; by Lewis F. Ostrander, George W. Franzheim, John J. Ostrander, William F. Stewart and Cabell Gray, all of St. Louis.

The Canadian St. Marys Co. of Chatham, Ltd.; capital, $200,000; to manufacture gasoline and oil engines; provisional directors, Wm. E. Gundy, James A. McNevin, Wm. C. Livingstone and others.

Combination Transmission Clutch Co., Manhattan, New York City; $10,000; to manufacture machinery, etc.; by Louis E. Bomeisler, George Sakson, 135 Broadway; Herman Gustow, 235 Broadway, New York City.

The Pierce, Wells & Keedwell Co., New York City.; $10,000; to manufacture motors, engines and machinery; by Peter Krulder, Bronx; Albert C. Keedwell and Albert D. Keedwell, 171 West Eightieth street, New York City.

Automatic Train Connector Co., Harrisburg, Pa.; $100,000; to manufacture apparatus for railroads or railway trains, signaling, interlocking, heating, breaking, block signaling, etc.; by Charles C. Stroh, John T. Brady, W. W. Wyant, all of Harrisburg.

Ellwood City Nail Co., Ellwood City, Lawrence county, Pa.; $20,000; to manufacture nails, screws, rivets and similar articles made from iron and steel; by August Miller; G. T. Laughlin, Ellwood City, Pa.; Ira E. Bixler, George E. Blythe, Pittsburgh.

Cressman-Kleinman Manufacturers' Co., Philadelphia; $5,000; manufacture, purchase and sale of iron, steel, copper and other metals; by Nelson C. Cressman, Norristown, Pa.; Herman J. Kleinman, Philadelphia; Elmer F. Larlor, Pennsauken, N. J.; Susan R. Cressman, Norristown.

The Waddell Mfg. Co., Paterson, N. J.; $100,000; to manufacture metal shades in copper, brass, aluminum, cast iron, etc.; by M. Waddell, 30 Church street, New York; E. Payson Cooke, 354 Fifteenth avenue; Chas. D. Cooke, 377 Twelfth avenue, both of Paterson, N. J.

General Industrial

The Kerbaugh branch, at Bellwood, Pa., of the Cincinnati Equipment Co., lately declared bankrupt, will be sold at auction on May 1.

The Los Angeles Machinery & Supply Co. has been incorporated at Los Angeles with a capital of $20,000. Directors are: J. H. Gerdes Jr., J. C. Huggins and Othelia O. Huggins.

The Bucyrus Co., South Milwaukee, Wis., has been awarded the contract for furnishing one 66-ton electric shovel for the Lahontan dam work in the Truckee-Carson, Nev., irrigation project. The contract price is $12,050, f. o. b. Milwaukee.

The George R. Kress Co., of Pittsburgh, is the name of the company to be incorporated by George R. Kress, O. A. Steuernagle and George R. Kress Jr. The new company will manufacture lightning rods, lightning conductors and fittings for the same.

The Standard Sheet Mfg. Co., Washington, Pa., has applied for a charter

at Harrisburg with an authorized capital of $50,000. James S. Forsythe, R. H. O. McDonough and A. C. Warne, Washington, Pa., are the incorporators.

Fred Elvin and Louis Wolff, of Racine, Wis., have formed a partnership with two brothers, Gustave and Max Wolff, of Joliet, Ill., and have established a brass pattern manufacturing business at Joliet under the name of Wolff Bros. Co.

The Beldon Engineering Co., of Pittsburgh, has filed a notice of an increase in the capital stock from $25,000 to $50,000. The company has to do with the automobile industry, and owns a number of patents affecting automobile construction.

The Trojan Machinery Co., Troy, N. Y., has been incorporated with a capital of $1,000 to manufacture machinery and tools. The directors are William H. Tolhurst, Pittsfield, Mass.; Clark H. Foster, and Charles H. Aldrich, Troy.

The plant of the Ewing-American Motor Co., Findlay, O., will be sold at public auction within the next month, following issuance of an order of the United States court at Toledo. John M. Barr is receiver of the company.

The National Aluminum & Bronze Mfg. Co. was recently organized in Indianapolis by H. J. Weiler, 1416 Roache avenue; E. Davis and H. Hunt. The company, which has been incorporated with an authorized capitalization of $10,000, will do a general foundry and machine business.

Application is being made at Harrisburg, Pa., for the incorporation of the Economy Supply & Mfg. Co., Pittsburgh, for the manufacture and sale of light machinery and specialties. H. W. Cleland, G. W. Cleland and E. C. Stafford are the incorporators, all of Pittsburgh.

The annual meeting of the Louisville Employers' Association resulted in the re-election of the old officers who include: President, W. Hume Logan, of the Dow Wire & Iron Works, and second vice president, Henry Vogt, of the Henry Vogt Machine Co.

The Hillen Mfg. Co. has been incorporated in Louisville with $20,000 capital stock by George P. Hillen, Oscar C. Hillen and William F. Hillen. The company will manufacture plumbing supplies. It has been doing business for some time, and has a plant at Floyd and Pearl streets in operation.

Announcement has been made that W. C. Talbot, vice president of the McIntosh Foundry & Machine Co., Monmouth, Ill., has taken over 90 per cent of the incorporated stock and will be in sole charge of the business. A. D. McIntosh, president, and F. M. McIntosh, secretary and treasurer, will retire.

Castings will be manufactured by the Indianapolis Metal Products Co., which has been organized and incorporated in Indianapolis with an authorized capitalization of $30,000. Those interested in the company are: Ivan Ellis, 467 West Thirty-first street; L. B. Sulgrove, 423 East North street, and Frank Woll Sr.

The Hess Iron Works is the name of a new corporation, organized at Green Bay, Wis., by William Hess, formerly of Manitowoc, Wis. The concern is capitalized at $25,000 and William J. Hess, Oscar Zapfe and E. E. Brown appear as incorporators. The corporation will succeed to the business of William J. Hess.

The Multi-Rate Co., Dayton, O., recently incorporated with a capital stock of $100,000, advises that its machines are being manufactured under contract by the Noyes Mfg. Co., Dayton, O. Officers of the Multi-Rate Co. are: President, H. E. Talbott; vice president, H. E. Talbott Jr.; secretay, C. A. Craighead; treasurer, A. O. Davison.

The Vendome Copper & Brass Works, Louisville, Ky., advises that it has enlarged its factory with machinery and equipment so as to enable it to erect the largest plant desired for distilleries, breweries, creosote, turpentine and all kinds of chemical and mineral working establishments. The company's present plant is adequate for immediate needs.

The William Ganschow Co., 1001 Washington boulevard, Chicago, has extended its shop to include the second floor of the building, adding considerable new equipment. The plant now includes the basement and the first two floors and is devoted entirely to the manufacture of gears. A very handsome new office has been fitted up on the second floor.

The Helmbacher Forge & Rolling Mills Co., which was absorbed by the American Car & Foundry Co., has applied to the circuit court at St. Louis for a decree dissolving its corporate existence. The petition is signed by the president, J. M. Buick, holder of 998 shares of stock; N. A. Doyle, secretary, and H. W. Wolff, director, holders of one share each. A motion to dissolve was adopted at a stockholders' meeting, Jan. 8, last. The petition declares the company has no indebtedness.

The Aluminum Castings Co., of Cleveland, O., which operates a number of plants in various cities, and which had planned to erect a new plant in Manitowoc, Wis., is understood to have abandoned this project owing to labor conditions in that city. The company has instead taken an option on a foundry in Milwaukee and it is expected that the Manitowoc equipment will be moved there, should negotiations be satisfactorily concluded. It is expected that the Milwaukee plant will employ from 300 to 500 men.

The Dayton Iron & Steel Co., Dayton, O., advises that it is not producing finished iron and steel, but is conducting a jobbing business in those lines, having succeeded to the business formerly carried on by The Dayton Iron Store Co. The business will be enlarged somewhat, and the lines carried will be extended so as to provide an adequate stock for the needs of the territory that can be served advantageously from Dayton. Officers of the company are: President, W. C. Kette; vice president, Charles B. Ozias; secretary and treasurer, Charles W. Haas. The executive committee is composed of Messrs. Haas and Ozias and William Dennick.

The Communipaw Steel Co. has been organized and incorporated under the laws of New Jersey for the purpose of conducting a general line of business in fabricating steel for the purpose of construction. The company has acquired the Metropolitan Bridge plant located at Jersey City, with a capacity of 18,000 to 20,000 tons per annum. It is in a position to handle structural steel orders for buildings 100 x 100 feet in dimensions and to 12 or 16 stories in height. The offices are located at 55-57 Liberty street, New York. Ross L. Lusk, formerly general sales manager of the National Bridge Works, New York City, and prior to that time New York manager of the structural steel department of the Bethlehem Steel Co., is president of the company. F. S. Marbury is vice president and Samuel A. Bingaman secretary and treasurer. The last two officers were also formerly connected with the National Bridge Works.

Trade Notes

The Weber Chimney Co., Chicago, announces that it has moved its offices from 209 South State street, to more commodious quarters in 1452-1456 McCormick building, that city.

The Otis Elevator Co. has established its offices and shops in Louisville, Ky., at 206 West Main street, occupying a large four-story building. The shops were formerly at a less desirable location and the offices in the Lincoln building. Albert E. Scott is manager at Louisville.